University News

A WEEKLY JOURNAL OF HIGHER EDUCATION MONDAY, JULY 31, 1995 Rs. 7.00

J.S. RAJPUT

The Commerce of Teacher Education

A. PONNAMBALA THIAGARAJAN, S. SANTHANA KRISHNAN & P. RAJENDRAN

Human Capital Formation

K.K. BAJAJ

Paradigm of Community Colleges
— Relevance to Indian Context

JAGANNATH MOHANTY & SUSANDHYA MOHANTY

IGNOU Educational Television Programmes
— An Appraisal

K. KASTURIRANGAN

Developing Complementary Attitudes
— Convocation Address

PROJECT BASED FELLOWSHIPS

WORLD POPULATION EDUCATION DAY

COMPUTER APPLICATIONS IN LIBRARIES

Association of Indian Universities

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REGISTR

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Editor :
SUTIN [illegible]

The Commerce of Teacher Education

J.S. Rajput*

The University received more than ten thousand applications for admission to its training colleges conducting programs leading to B.Ed. degree. It could admit less than two thousand of these candidates. Others had to be denied the opportunity. Sensitive minds suggested alternative strategies. The remaining candidates were given an option to take admission in the 'evening' program. The training colleges were awarded four to five times more candidates in the evening program than their sanctioned intake capacity. These candidates had to pay five to six times more fee than the regular candidates. This was compensated by several other unwritten concessions, like assurance of a degree which made no distinction between 'regular' and 'evening' programmes. University earned in crores and the 'authorities' received appreciations for generating resources. The faculty members got paid on per lecture basis and were not unhappy about this new source of earning. The candidates received their degree and joined the ever increasing number of un-employed trained teachers. In fact, they were, rather unfortunately, not only undertrained but also ill-trained.

This is not an isolated case of exploitation of young persons through educational programs organised by some of the institutions and universities at the highest levels. Those familiar with the scenario in teacher education would immediately identify several such well known institutions. It all started with the correspondence courses, invariably called distance education programs, with the stated objective of providing "training facilities for untrained in-service teachers through distance learning systems".

While they prescribed minimum eligibility qualifications in terms of teaching experience, the same was never looked into seriously at any stage. The fee structures are arbitrary and instruction materials are freely available in the shape of guide books and help books. Of course there are coaching centres to assist one and all. The most critical component of teacher training is to develop professional skills through discussions, teacher-taught interactions and supervised teaching by the trainees in actual classroom situations. These aspects are thrown to winds. These are learner friendly, resource generating programs launched to prepare teachers who are supposed to build the nation builders of tomorrow.

It is not very uncommon that whenever and wherever the status and stature of teachers is discussed, lament is mainly on the decline of the same. Often, a teacher is perceived as a demoralised individual complaining of practically everything around him. The 'guilty' for the same are easily identified by everyone; the governments, the administrators, heads of institutions, and others. On philosophical terms, references are usually made to the great tradition of Indian culture which respected teachers over and above the family, the parents, and even the gods. The picture has changed drastically in the present times. A general sense of despondency and demoralisation prevails amongst the teachers and about them in the society.

**Chairman, National Council of Teacher Education, New Delhi-110 002.*

A brief overview of the historical development, would easily reveal that in the Indian tradition only those who could pass a rigorous selection procedure, could become teachers. In fact, the traditions in Taxila and Nalanda speak of "*Dwar Pundits*". They were supposed to interview every aspiring learner. The testing was normally done on two counts. The first obviously was the scholarship, understanding and knowledge taken together, the second and of greater importance was level of the spirituality achieved. The cognitive and para-cognitive were given equal weightage. It was essential to do so as those willing to become teachers were supposed to be embodiments of good qualities, wisdom, vision and clear perception. Knowledge was meant for ascending greater heights in spiritual understanding, towards the attainment of ideals of truth and service to humanity. Education was supposed to be the only vehicle for liberation from the worldly thoughts, deeds and desires. A real teacher lived up to what he taught to his learners. He practised what he preached. He was the role model for the learner and received reverence from one and all.

The subsequent developments had seen several ups and downs. The educational system did change much. These changes were not always coupled with progress and improvement. There were external influences and such times when the very process of education was relegated to the background. The present educational system is, of course, a legacy of the alien system. It was designed for specific purposes and for a small clientele. After independence, we have applied this system to an entirely different situation. Now education is no more confined to a select few. The 'few' are no longer so as the 'numbers' have increased enormously. The system is cracking under the stresses and strains of the ever increasing numbers. It was never designed for 'all'. Significant changes in our education system have occurred at the policy level and also at the implementation level.

While the policies have been appreciated, the implementation has generally remained far behind the expectations. The quality of education has been the casualty, its repercussions on the quality of life are also evident to all. At this juncture in human history, education is supposed to improve the quality of life. It is to contribute to the national development and economic growth of the nation. This too is a big change from the earlier perception and approach where the education was meant to lead towards liberation and enlightenment.

The Decline

What are the other factors responsible for the systemic decline of the profession of teachers? The most important of these could be the degeneration of internal efficiency. The large scale expansion of schools, colleges, and universities resulted in a recruitment of large number of teachers. There obviously was the inadequacy of infrastructural inputs and well trained and professionally prepared manpower. Even otherwise, in any system unprecedented expansions always result in dilution of quality. Educational expansion in India has been no exception. We faulted particularly on one count in our schools. The professionalism in teacher education could not be upgraded adequately. There were gap areas in administration, management, infrastructures and community acceptance of the importance of teacher training.

No system declines in isolation. Education is supposed to provide manpower to different sectors of developmental activities in the country. It has also contributed to the scientific and technical manpower of developed countries, at our cost. Alongwith this, we have also prepared educated young persons not equipped to undertake skilled jobs, self-employment or entrepreneurship. They simply wait to get some employment which again, because of numbers, mostly remains an elusive expectation. Obviously, the education system has succeeded in several areas and at the same time lagged behind in more than several areas. During the last few years, there have been changes of far reaching consequences in educational developments. The World Bank and some other funding agencies have entered the elementary education sector for the first time.

That the educational expansion is aimed at enhancing the GNP of the countries is now very clear before the developing countries. It was the World Bank and other funding agencies along with Unesco, Unicef, UNDP which sponsored the Education for All conference in Jomtien in March, 1990. In the changing times there is no harm in accepting this premise. However, in the eastern culture the liberating role of education will not be discarded. It may, however, remain confined only to a select few. In the overall context, there are increasing demands on the education systems in terms of programmes, policies, techniques and manpower preparations. The resource crunch is inhibiting several innovative initiatives that could be relevant to educational development. This includes training and orientation of teachers in the context of quality improvement.

An overview of educational scenario at the school stage, would reveal the need to prepare teachers who understand the objectives of teaching and are familiar with the new techniques and technologies of teaching and learning. Unfortunately, the resource inputs in this area have been meagre. The preservice teacher education programmes have somehow not improved much in terms of content, processes and methods. The inservice education of teachers is often conducted in an uncoordinated manner. It does not respond to the specific needs of teachers and as such expected results are usually missing.

The Misinterpretations

When the education was meant for a selected few, the Socratic model of one teacher to one student was applicable. With growth and development of school system, the teacher pupil ratio 1:30 is considered reasonable. With the distance education strategies taking concrete shape, now is a stage when one teacher could teach anywhere from few to tens of thousands of learners. This clientele could be anywhere within the country or even outside the country. The distance education techniques could be one of the most potent strategies for professional upgradation of teachers, both at preservice training stage as well as inservice orientation stage. Unfortunately, in India in teacher education at least, this strategy has been grossly plundered and misutilised: It has been used to award degrees and teacher training qualifications without any pedagogical and academic soundness. The rigour necessary to give status and stature to a professional has been reduced to practically nothing. In the name of generating resources the universities have thought it fit to initiate correspondence education programmes enroling upto 20 to 30 thousand teacher trainees. The quality of these programmes is known to the entire nation. The young person with degrees and nowhere to go fall-prey to such strategic machinations, in the hope that at some stage, these 'professional' degrees could be of help. These programmes are conducted by even those universities which do not have a single regular faculty member in education. One can imagine what would happen to the basic requirements of teacher preparation in this situation.

At present, in the school education system, the number of teachers is around 4.5 million. If the teachers of higher education sector are also included, the number rises to seven million. It is now globally accepted that teachers in the higher education system also require orientation in teaching techniques and in the basics of philosophy, psychology and related developments. The establishment of Academic Staff Colleges in India is a consequence of such an approach. The significance of teacher education is, without doubt, much greater at the initial stages of learning, the preschool stage, the primary stage and the secondary stage. The criticality of teacher education finds a prominent mention in the 1986 National Policy on Education which envisages 'overhauling of the teacher education system' and restructuring and strengthening the same. This was the right stage for the same is evident from the fact that the percentage of trained in the schools which was around 60 in 1960, stands at 91 in 1993-94. In States like Tamil Nadu, and Haryana, it is 99%. However, it is the universities in these states which seem to be over concerned about training large numbers of teachers through a badly mutilated strategy of correspondence education. More and more universities from other states as well have plunged into the lucrative enterprise for the 'benefit of young persons, women and weaker sections'. There is no restriction and logic in the fees prescribed. There are instances where universities have given data indicating a 'saving' of crores of rupees out of B.Ed correspondence programmes. The resources so generated could be utilised for building construction, like the medical college or the administrative block of the university. Attempts are made to put forward academic arguments in favour of such programmes without any hitch and hesitation. However, no one in the country has any doubts about the real motivation for these enterprises. That these courses are only for serving teachers is a well known myth.

The correspondence education programmes normally draw upon the resources of regular institutions including training institutions and schools. This seriously hampers the quality of the programmes of these institutions. Even in the long run, the well functioning institutions and their products will suffer for no fault of theirs. With large number of trained teachers already on the live registers of employment exchanges and unrestricted numbers being trained by correspondence courses, the real sufferers are those who undergo a rigorous training programme in a well equipped training institution.

The educationists and academicians in this country have maintained that the first qualification in teacher education should be obtained only through intensive classroom interaction under the supervision of well trained teacher educators over a period of considerable duration. In a compilation recently attempted, there are 14 out of 15 committees and commission's reports which recommended discontinuance of the existing correspondence education programme in teacher education at the initial training stage.

The Potential Strategies

Policy, 1992 and the Yashpal Committee (1993-94) have endorsed the view that teacher training programmes must provide adequate trainee-learner-interaction in good institutions. The Ramamurty Committee (1990) recommended that "the first degree in teacher education should not be given through correspondence education." This aspect was analysed in depth by the Committee appointed by Central Advisory Board on Education (CABE), which found the recommendation of Ramamurty Committee 'very sound' and desired that 'it needs to be followed up vigorously by the central and state governments and the universities.' It has further elaborated the need for immediate action :

> *"Unless firm and effective steps are taken immediately to put an end to the commercialization of teacher education, it would be futile to talk about education standards."*

The Supreme Court of India, in connection with some cases of primary teacher training institutions of Tamil Nadu, has delivered a historical judgement on 15th June, 1993. In this judgement the Hon'ble Court recalled its earlier judgement of 1986, which states :

> *"The Teachers Training Institutes are meant to teach children of impressionable age and we cannot let loose on the innocent and unwary children, teachers who have not received proper and adequate training. True they will be required to pass the examination but that may not be enough. Training for a certain minimum period in a properly organised and equipped Training Institute is probably essential before a teacher may be duly launched."*

It is as such implicit on every university, institution, Board of School Education, and of course the governments, to ensure that the viewpoint expressed by educationists and endorsed effectively by Supreme Court is given due respect and consideration. What is required is a value-based approach towards improving the quality of teacher training institutions, the teacher training programmes and the teacher educators. This is a pre-requisite to all other initiatives in education including the efforts to universalise elementary education. Unless the teacher education institutions become effectively functional and the teacher training is conducted with all the seriousness and professionalism, the dream of good quality education for all would remain a dream.

UNIVERSITY OF PUNE
Department of Physics

Temporary Appointment of J.R.F.

Applications giving biodata on plain paper are invited for the Junior Research Fellowship (JRF) (Tenure not exceeding three years) so as to reach Dr. S. Mahamuni, Department of Physics, University of Pune, Pune-411 007 before **August 25 '95** to work on projects entitled "Size Dependence of the Electronic Structure of II-VI Semiconductor Quantum Dots: Experiment and Theory" sponsored by DAE. Essential qualifications M.Sc. (Physics, Electronics Science, Chemistry) and NET/SET/GATE cleared. Fellowship Rs. 2500-2500-2800 + H.R.A. 450.

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Date : 18/7/1995 **REGISTRAR**

HUMAN CAPITAL FORMATION

A. Ponnambala Thiagarajan*
S. Santhana Krishnan**
P. Rajendran***

In Economics, it was thought for a long time that it was a physical capital which played a crucial part in expanding production. In recent years, a new concept of "Human capital" has been evolved and emphasized. The term "Human capital formation" refers to the process of acquiring and increasing the number of persons who have skills, education and experience which are critical for economic and political development of a country. Human capital formation is thus associated with investment in man and his development as a creative and productive resource (*Harbison*, 1962).

In its wider sense, investment in human capital means expenditure on health, education and social services in general and in its narrower sense it implies expenditure on education and training. Mehta (1976) rightly says that a rapid rate of human capital formation is as important a precondition for economic growth as the rapid rate of physical capital formation.

Studies made by Schultz, Harbison, Denisan, Kendrick, Abramovitz, Becker, Bowman, Kuznets and a host of other economists reveal that one of the important factors responsible for the rapid growth of American economy has been the relatively increasing outlays on education. They tell us that a dollar invested in education brings a greater increase in national income than a dollar spent on dams, roads, factories or other tangible capital goods. In Galbraith's words "We now get the larger part of our industrial growth not from more capital investment but from investment in man and improvements brought about by improved men". Even earlier, economists like Adam Smith, Veblen and Marshall stressed the importance of human capital in production. The level and rate of economic growth depend on natural resources, physical capital accumulation, human resource development and technological progress, provided the socio-cultural environment is favourable to growth. Capital and natural resources are passive factors of production, human beings are the active agents who accumulate capital, exploit natural resources, build social, economic and political organizations and carry forward national development. Clearly, a country which is unable to develop the skill and knowledge of its people and utilize them effectively in the national economy will be unable to develop anything else.

Need and Development

Human capital formation is needed for any organisation that wants to be dynamic and growth oriented and/or to succeed in a fast changing environment. An organisation can become dynamic and develop only through the efforts and competencies of its human capital. Thus human capital formation is an essential process for organisational survival and growth and optimal level of "development climate" is essential for facilitating the human capital formation.

Human capital is formed by education and has proved to be an active agent of economic growth. Human capital formation (HCF) departments have grown in number in Indian organisations in the last few years. HCF has gained increasing attention in the last decade from human research specialists, training and development professionals, chief executives, line managers and educationists. Many dimensions of HCF have been integrated into research, training and organisational design and change. Others are still being explored (*Udai Pareek and Rao*, 1986).

Human Capital Stock Indicators

For the purpose of international comparisons, the following indicators of the stock of human capital would be useful :

(1) level of educational attainment; and (2) the number of persons, expressed as a percentage of population of the labour force, which is engaged in high level occupations, like scientists, engineers, managers, teachers, doctors, scientific and engineering technicians, nurses and medical assistants and persons in the foreman and skilled worker category.

The "second best" measures, indicating the growth of HCF universally recognised, are (i) the number of

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**Principal, **Director, ***Research Scholar, Centre for Research in Education, V.O.C. College of Education, Tuticorin-628 008.*

teachers (primary and secondary levels) per 10,000 population; (ii) engineers and scientists per 10,000 population; (iii) physicians and dentists per 10,000 population; (iv) pupils enrolled at the primary level as a percentage of the estimated population in the corresponding age-group; (v) the adjusted school enrolment ratio for primary and secondary levels combined; (vi) pupils enrolled at the secondary level as a percentage of the estimated population in the corresponding age-group; and (vii) enrolment at the higher level as a percentage of the population in the corresponding age-group. The first three are partial measures of the stock of human resources and the next four are measures of addition to it.

Harbison and Myers, using the above indicators of HCF, as far as practicable, developed a simple composite index to distinguish countries in terms of "four levels of human capital formation" viz (i) underdeveloped; (ii) partially developed; (iii) semi-advanced; and (iv) advanced. The 75 countries for which this index was developed were classified as follows :

Table 1 : Classification of Countries

Levels of Development	*No. of countries*
Level I—underdeveloped	17
Level II—partially developed	21
Level III—semi-advanced	21
Level IV—advanced	16

(*Source:* Ishwar C. Dhingra. The Indian Economy: Resources Planning Development and Problems. Sultan Chand and Sons, New Delhi 1991, p. 108)

India has been classified as a semi-advanced country in terms of HCF along with 20 other countries among which the more prominent are Spain, Hungary, Italy, Poland, Yugoslavia, Czechoslovakia, Norway, etc.

Strategies for Human Capital Formation

The following are the main strategies:

(a) Enrichment of primary education with the help of educational technology; (b) Universalization of primary education; (c) Compulsory and free education upto 14 years; (d) Importance of vocational or craft education at the higher secondary level; (e) Making school education more effective with appropriate teaching technology; (f) Improving quality of teacher education (g) Making non-formal education to keep up with the fast changing world; (h) Checking population explosion; (i) Starting multipurpose schools; (j) Encouraging science and technical education; (k) Promoting rapid industrialisation and using indigenous technology; and (l) Giving priority to research institutes for all faculties.

Schultz suggests a typical list to identify the more important categories of activities that improve human capabilities: (1) health facilities and services broadly conceived to include all expenditures that affect the life expectancy, strength and stamina and the vigour and vitality of the people; (2) on-the-job training, including old style apprenticeship organised by firms; (3) formally organised education at the elementary, secondary and higher levels; (4) study programmes for adults that are not organised by firms, including extension programmes notably in agriculture; and, (5) migration of individuals and families to adjust to changing job opportunities.

Pattern of Investment

So far as the pattern of investment in education is concerned, almost all the underdeveloped countries in Asia, Africa, and Latin America accord a high priority to primary education, which is often free and compulsory. But it leads to considerable wastage and stagnation and puts a severe strain on the physical facilities and teaching personnel of educational institutions. Secondary education, on the other hand, is accorded low priority. It is however, people with secondary education who provide the critical skills needed the most for economic development. Emphasising the importance of secondary education, Lewis regards persons with a secondary education as "the officers of an economic and a social system. A small percentage goes on to university education but the numbers required from the university are so small that the average country of upto five million inhabitants could manage tolerably well without a university of its own ..... The middle and upper ranks of business consist almost entirely of secondary school products and these products are also the backbone of public administration".

Functions of Human Capital Formation

i) Modern technology is becoming more and more complex. With the growth of science, machinery and equipment are becoming more and more sophisticated. Their efficient operation requires skill and technical knowledge. These can be acquired only through human capital formation programmes;

ii) Knowledge about production and management of economies is expanding at a very fast rate. In order to keep pace with this growth, it is necessary that a developing economy like India should increasingly provide scope for assimilation and adoption of that knowledge;

iii) Pace of economic development can be accelerated by maximising the influence of the factors which contribute positively to economic growth through the improvement in the level and quality of education; and

iv) HCF is required to modernise attitudes. A backward social system and primitive attitudes and beliefs cannot go along with economic development.

In short, HCF is an important condition for improving productivity and raising the level of production which hold the key to economic development.

Factors Affecting Human Capital Formation

(a) Population

Human capital is both the instrument and goal of economic development. As an instrument, human capital supplies an essential factor service, that makes the other factors work viz labour and entrepreneurial ability. In this role, human capital determines the size of total output in the economy. On the other hand, all development activity in an economy is undertaken to provide better living condition to human beings. Human capital as consumption units share the total output of the economy. Thus we can look upon human capital in two roles viz (i) as factor services, and (ii) as units of consumption.

(i) Human capital as factor services

Human capital as factor services, provides labour and entrepreneurship. Economic development depends upon the human ability to exploit natural resources.

(ii) Human capital as units of consumption

In their role as units of consumption, human beings make a demand on the national product of the economy. In this capacity their number matters. If the size of population outstrips the natural product, it leads to a number of problems. To this situation, we give the name of "Over population". Over population in a country gives rise to several problems. In a nutshell, rapid population growth presents an obstacle to growth of living standards, inasmuch as it acts as a barrier to capital accumulation.

(b) *Financial outlay on education*

Education has been a low priority area in terms of the resources allocation in our plans. A glance at the percentage share of funds for education in the total plan outlay would reveal that it has been decreasing from the third plan onwards, as shown in the table.

The trend in growth of educational expenditure indicates that the magnitude of additional expenditure on education associated with each additional unit of national income has been declining over the past decades. During the first decade of planning period i.e., 1951-60, an amount of Rs 4.4 was spent on education out of each additional increase in national income of Rs. 100. In the subsequent decades, the incremental expenditure on education associated with the national income has come down to Rs 3.6 in 1971-83, after an initial decline to Rs 3.4 in 1961-70.

Further, the Education Commission after thoroughly examining the interlink between education and

Financial Outlay on Education

(Rs. Crores)

Plan	*I*	*II*	*III*	*Annual Plans*	*IV*	*V*	*VI*	*VII*
Amount (At current prices)	149	273	588.7	306.8	774.3	1285	2523.74	7692.6
Amount (At 1970-71 prices)	304	526	966		–764	585	1047	1894
Percentage of total	7.9	5.8	6.9	4.9	5.0	3.2	2.59	3.46

Source : NIEPA: Basic Educational Data, and Economic Survey 1989-90.

economic development, had recommended that the expenditure on education should be raised to 6 per cent of the national income by 1985. In simple words, education has been a low priority area in the Indian economy. After the high priority areas like industry and agriculture had their required shares, whatever was left in the resources pot used to be distributed among the low priority areas, among which education also figured. In view of the strong positive correlation between national income, economic growth and expenditure on education, a declining trend in allocation of resources for education would have an adverse impact on the national goal of alleviating poverty through raising income and reducing population growth. Hence there is a need for planning educational expenditure on some priority basis. This last point calls for a proper manpower planning in the country i.e. a proper balancing of demand and supply of manpower.

Guidelines to HCF

In general terms, following steps are necessary for human capital formation :

(i) Forecast the demand for manpower in various occupations;

(ii) Collect information relating to the availability of trained personnel;

(iii) Arrange training programmes to impart skills to the untrained personnel;

(iv) Arrange for alternatives and encourage new entrants to go in for them if it is found that the supply of a particular category of trained personnel is more than demand;

(v) Offer incentives in the form of higher wages etc to attract labour to such occupations;

(vi) Provide necessary facilities to promote labour mobility between different occupations;

(vii) Ensure that the trained personnel are available in the country to make use of the new techniques of production;

(viii) Education and training should be linked to the job; and

(ix) Financial constraints can be eased by using methods that reduce unit costs, or raise new revenues, or by reallocation of existing revenues.

Conclusion

Human capital formation has remained a low priority area in Indian economic planning. Braindrain, in the context of developing countries, is synonymous with the flight of educated people like scientists, teachers, doctors, engineers, nurses, etc to other developed countries like UK, USA, Canada, Australia, etc with an implicit resolve to 'non-return' or 'prolonged stay abroad' in gainful employment.

A report of March 1982 informs that India is one of the major suppliers of skilled manpower to developed countries. The report further points out that India has incurred a loss of about Rs. 1,400/- million on this account. There is also a financial contribution by emigrants abroad in terms of remittances sent home to family still resident here.

Anyway, if one were to seek the reasons behind this type of migration, one would be convinced that the braindrain occurs because the homeland fails to provide adequate opportunities for a proper use of the acquired skill of these personnel. If we want to prevent 'braindrain', concerted efforts will have to be made at human capital formation.

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Paradigm of Community Colleges

Relevance to Indian Context

K.K. Bajaj*

Demographic changes, attitudes towards public finding, social relevance of education and emerging occupational patterns now have a significant bearing on the direction and quality of post-secondary education. There is explosive students' growth with conservative attitudes towards the state's role in higher education. Though all educational planning is a little interrelated particularly in terms of the instructional methodology, delivery system, and relevance of academic content of courses to employability of students, yet in a formal system of higher education functional paradigms are comprehensive and specific with a hierarchy full of pre-determined parameters which contribute to close relationship of the society with its products. The educational goals are specific and curricula are comprehensively structured to meet their needs. Collegiate system of post independence era is a record of expansion without corresponding improvement in its core content to fulfil social aspirations and goals. If the entire system is taken into account with retrieval and analysis of data, it is clear that the gamut of collegiate education despite its impressive statistical record, has been a puerile continuation of a system without catering to spectrum of social attitudes, backgrounds, achievements, objectives and cultural determinants of students. The system has thrown up a multitude of unemployed, underemployed or improperly utilized products. At least social belongingness and sense of security among the graduates have not been generated. There have been numerous commissions and committees to suggest corrective measures but there has only been a compelled intensive discussion on questions as to how to maintain the status quo in colleges and universities in the country without substantially contributing to human resource development while it was always agreed that the community had a lot much at stake in the entire higher education effort. Now increasing competition, frustration, lack of relevance of range of activities to social use despite rapid scientific advancement, have contributed to the evolution of fresh insight to the application of tools of education to social use. In this endeavour a new paradigm of community colleges has come to be addressed.

Establishment of Community Colleges (CCs) has been a noteworthy innovation in America to offer expansion of opportunities and availability of education beyond post-secondary level. As an institution of recent maturity, recognition and interest, it is more vitally linked to community requirements and works with a strong emphasis on a variety of vocational programmes offering a diversity of opportunities for a life long education accessible to all. Its popularity has been due to strong community relevance with its capacity to meet community obligations. These are philosophically and academically committed to the attainment of competence in defined areas of societal needs. The entire idea here is to give people an opportunity to meet their own needs and to achieve their own improvement. They admit students with an age span which may go from 14 to 80 years in a single institution with full time or part-time faculty. The financial support is available from the state, the community through local taxes, and the tuition fees. These colleges have financial procedures and draw negotiated budget funding from states linked to unit rate formula. The genesis of such institutions has emanated from the known economic benefits of education; education as a tool of social mobility; education as a tool to break the social poverty barriers and also to involve the local community to the cause of education. The two years course in such CCs offers a major entry point for students who may later on like to go in for degree programmes in conventional colleges and universities. In fact, there is a distinct articulation between the inputs of the community college towards its learners and the requirements of degree programmes. Its faculty is generally supportive of the community involvement in it. The main idea is development of human resource with an eye on community benefit role. The traditional structure constitutes such major components as academic affairs with all course-related methodology and delivery system etc., student services including guidance, counselling, testing, financial aid, placement etc., and business management including accounting control with functions like those of most educational institutions, etc.

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The CCs *provide service to an amazingly broad* spectrum of community needs. Educational and social benefits accrue to the community because broader and *more diversified educational programmes* are planned and a greater interchange of ideas and experiences takes place. They differ from other conventional colleges in their local decision making responsibility for providing education to the entire community. With the urban and rural areas engaged in complementary functions and to share collective experience such colleges play an important role in providing extra educational and cultural meaning. The primary intent is towards accessibility of lifelong higher education to aid regional and social development. They offer a range of career development programmes with academic skill enhancement packages for partnership in industry. They offer wider range of courses for divergent students treating every student as a learner of the system. They all subscribe to the philosophy of adaptability, capability of responding to new conditions and demands of circumstances. They are sensitive to community needs irrespective of the learning life time of its students. They are the seats to accommodate diversity of educational needs while providing commitment to self-improvement. So while a CC is correlated to societal needs of its surrounding community, it offers definite programmes of academic skill enhancement.

Recent years have seen resurgence of interest in community support services. Community broadly would mean group of people who share social, economic and cultural interests and also share social obligations, common values and identify with each other as 'we'. Though the *institution of CCs or people-run* colleges is now more than ninety years old with the present array of over 1400 community colleges in America with about 5% of its total population enrolled in higher education out of which about 2% is enrolled in CCs, the concept is now being studied here with UGC placing this high on its agenda after having received feasibility report of these colleges for India. The concept has gained consideration particularly in the context of spirited advocacy in favour of privatization of education and globalization in a market economy of consumerism and commercialization of inputs. All investment in education is desired to contribute towards making it an asset with defined relevance and its utility *to social needs. They are also* being advocated in the context of emerging cultural shift and people's need for more education and employment. There is no doubt that the CCs in their composition, classification, approach etc, are *different from our traditional colleges* in terms of their emphasis on knowledge, skills, competencies, mobility, credit transfer, vocational content, *entry conditions*, age *norms*, *faculty*, *finances etc.*, yet despite these ideological underpinnings the kind of major creative role assigned to such colleges in America cannot be envisaged here. Here each village, city or region presents a tableau of characteristics dependent on population distribution, social beliefs and land use. Even the large cities ferment in rapid change with immigration of people and their activity. In a country of our dimensions, the primary concern has to be the consolidation of existing institutions rather than to go in for alternatives experimented in a country with almost no unemployment. In our resource starved country, for such experiments which call for long perspective planning and committed expenditure, it is difficult to apportion additional resources. While the entire programme is aimed at economic development through development of occupational opportunities, its *educational validity will continue to be questioned* because of its weak relationship between study and work and lack of convergence between intention and actuality. The paradigm would continue to be wholly irrelevant and as one amateurishly conceived. Its sustainability and impact would also be critical issues linked to social mobilization and creation of a culture amenable to its adoption.

Indian higher education is increasingly beset with amorphous planning and instability as can be seen from various commissions' recommendations and reviews available from time to time. Policy makers have no control over grants or financial status of institutions. *Even when establishment expenditure will* predictably be heavy in its envisaged setup of CCs, community cooperation and participation will have to contribute continuously for its survival. Illiterates with orthodoxy as a fact of their lives and with average intelligence, and poverty of means cannot constitute the required local support for its growth. Even otherwise, our entire higher education is the concern of the state and central governments. Even the so called non-government colleges lean heavily for grants on the state governments for their survival. And the governments oblige them as if they are performing a social responsibility function. While the rural population is 76.7% and this population is to be the target group for the community colleges, a new ethos at variance with the overall culture would be difficult to contemplate for the development of such colleges particularly when the major part of the faculty does not want to move out of the cosmopolitan cities and serve in rural areas. Many of our colleges, even otherwise, are academic slums both in terms of quality of education and infrastructure. Against this backdrop it is difficult to reconcile with the idea of any substantial budget being sliced in favour of community colleges.

As the management patterns and scope of collegiate education are fast changing, search for new options and alternatives is inevitable. The financial crunch, student preferences and enrolment problems have made the approach difficult. With the expanding demand for educational opportunities, Distance Education mode has acquired greater attention and relevance. Through its relaxed entry rules, flexibility in course choice and for providing quality education through learner centred services, it deserves to be strengthened. Though quality of Open and Distance Learning varies like any other form of education yet it is a better alternative and calls for greater support for its consolidation as a national movement for higher education. This is proved beyond doubt that it is cost effective and is easily accessible. With advancing technology it is emerging as a strong channel to supplement the conventional system with its own target group and educational programmes with a fairly defined method of instruction and training. Open universities demonstrate the openness of a learning system. With better management of students support services it has many learner friendly strategies to register its strong presence in higher education scenario with enthusiasm and relevance.

Community colleges in America exist in a healthy economic environment which is a significant factor contributing to their survival. The academic courses have a strong relationship with work. There are successful placements qualitatively. There is no perceptible gap between campus personality and work personality of learners as they align work to educational objectives. The system is goal-oriented. Community is supportive. The programmes are educationally derived and diversified. On the contrary if this is put up as a hybrid between the conventional secondary system and the graduate programmes of the colleges in India it will be a queer buffer which will neither be able to establish linkages with the secondary system nor grow into the corpus of our conventional graduate programmes offered in the colleges. It will also be unable to be terminal in its course. The community inputs will at best be limited to labour or local materials. The scheme will suffer from ambiguities and poor organisation even at the level of self-help like many other schemes which are government sponsored and meet the inevitable fate after government support is withdrawn. There cannot be community taxation either to generate resources; no massive donations and gifts and no revolutionary self-help operations either. At places controls will sometimes inhibit efforts and prove counter-productive. They will even stifle initiatives. Thus it will be yet another experiment which will erode our scarce resources and will be a patchwork of local functions and foreign experiments. Thus it will neither be a help to the community nor will it provide a sound basis for continuing planned education. In the circumstances what is required is to improve the present collegiate system and generate viability and strive for accountability at every level while making the programme of development and student services socially relevant. Increased emphasis should be on competency related education rather than on courses terminating in routine award of degrees of no consequence. In all areas such as faculty, finances, infrastructure, student counselling, courses etc, new inputs are called for to revitalize the present system which has reached a stage of stagnation because of political lack of will and resistance to change at all levels. So while institutions may continue to expand to accommodate popular demand, related imperatives of such expansion should be identified and strengthened by the government while also not losing sight of principles of quality, quantity and equity. The existing colleges should be shaped into high performing institutions with a commitment to development and change with inbuilt safeguards to check social exploitation.

In the maze of existing types such as affiliated, constituent, autonomous, maintained single and multifaculty conventional and professional colleges, controlled whether by the government, university, or non-government organisations, the social and educational ties and performance outcome in terms of their products require to be objectively appraised. The universities have to redefine their role in the collegiate sector. The UGC has to look at its assistance profile vis-a-vis the collegiate sector. About half of the colleges are not even eligible to draw assistance which even otherwise is less than 20% for all the colleges even though they constitute the mother sector of higher education with over 85% students in them. The organic continuity of effort between the colleges and the universities has to be addressed to the community needs as such. Vocationalisation at the first degree level is the one area in which the UGC has of late evinced keen interest and has registered its major thrust in the colleges. The programme, yet in its infancy, requires rigorous timely monitoring and continuous evaluation linked to defined performance indicators to give the desired results. The courses have to be generated and faculty trained in terms of societal needs and applicability. The diverse area specific needs require to be integrated into the system.

Before the experiment of community colleges is undertaken, a competent look at the role and performance of the existing colleges, established in the country over the years and related to the community would be helpful. Some of the colleges are, as such, excellent in their performance with regular support offered either by the government or the universities. They also excel because of strong social support and able management and they are serving the community and address their endeavour to the societal requirements. There are others which are an apology in the name of colleges. They are the products of political ambitions promoted by university apathy as the latter admits them to its privilege of affiliation as a formality of sorts without insisting even on the fulfilment of basic academic and infrastructural requirements. To substitute these into community colleges or to open community colleges in such areas would be to repeat the folly and give higher education yet another go by. Community colleges may be bold experiment but is wholly unsuitable in a country with little academic norms and where apathy is a way of life and where the universities, in the existing case of affiliated colleges have failed to offer their positive leadership to the satisfaction of society.

The CCs will suffer from a large number of practical aberrations. The validity of their courses, mobility of students, evaluation and above all the management will be the most difficult challenges to be faced by those who now advocate the idea of their establishment even in a modified shape. Even if they run the courses of their own volition and relevance, their equivalence and accreditation will be difficult without a well defined system of their academic evaluation and credibility. Their performance will always be in jeopardy in the context of trickling flow of funds as is the experience in case of other institutions of higher education where resource crunch is a fact of life. It has been suggested that community colleges, because of their location and linkages with the community will be best suited for the introduction of much needed vocational courses. They will produce the work force required for development and enhance the self employability of our youth to reduce the problem of unemployment. Rather than opening such colleges with the imported brand name of community colleges it would be worthwhile to consolidate the existing over four hundred institutions with vocational courses and give them a new orientation and direction to enable them to address adult learning needs of the community. The funds being limited, the distribution has to be judicious while bringing societal priorities centre stage through the existing institutions of higher education. The changes, if any, have to be conceived as an indigenous movement with a focus on local employment needs and work place relevance with conceptual curricula. This alone will result into its assured survival with extensive involvement of the people.

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IGNOU Educational Television Programmes

An Appraisal

Jagannath Mohanty[*]
Susandhya Mohanty[**]

Introduction

The concept of open university has emerged to meet the rapidly changing needs of the Society. G. Ram Reddy has rightly observed, "All over the world the open universities are being organised to provide innovative, flexible and high quality distance education. This is being done to meet the diverse educational needs of the people who cannot, for a variety of reasons, go to the conventional system, but who would like to have access to higher education". The open university system has been initiated in order to augment opportunities for higher education and as an instrument of democratising education. It is also an important means of socialising education with emphasis on equality, equity and justice.

Indira Gandhi National Open University (IGNOU) was established in the year 1985. IGNOU television video programmes are telecast through the national channel on Mondays, Wednesdays and Fridays for half an hour each day. Tele-teach system is here examined with questions for the real pedagogical significance on the grounds of expected influence on the learners. The one track flow of information may defeat the larger goals. So there is a need to incorporate the student-teacher interaction in the process. Since tele-medium plays a vital role in IGNOU's network of the learning resources, the researchers thought it necessary to explore how the IGNOU ETV programmes influenced the viewers.

Objectives

The study purports to meet the following objectives :

i) to Study the qualitative aspects of IGNOU programmes;
ii) to identify the strong and weak points of the programmes;
iii) to study the appropriateness of the programmes; and
iv) to suggest measures for improvement of the programmes.

Methods & Techniques of Data Collection

The researchers observed the IGNOU ETV programmes sponsored by IGNOU's Communication Division with keen interest and took a sample of 20 such programmes telecast during the period 8.2.95 and 31.3.95. The details of the programmes are given in Table. The data were collected through direct observation of the researchers. The researchers collected data regarding the objectives, content, format, visual aids, voice pace, presentation of the topic and the clarity of the content and voice, etc of these programmes with the help of an observation schedule.

Analysis and Interpretation

The data thus collected were analysed and interpreted in the light of objectives, content, visual, voice, languages, pace, presentation and format, etc.

i) Objectives

An educational programme without objectives is like a letter without address. So the researchers took some assumed objectives like knowledge, understanding and application, etc of the IGNOU ETV programmes for their assessment. Table II shows the weightage given the assumed objectives. It shows that all the programmes emphasised 'knowledge' objective to a great extent. As regards 'Understanding', 55% of the programmes emphasised this objective to a great extent and 45% to some extent. 'Application' objective was emphasised to a great extent in 45% programmes, to some extent in 35% of the programmes and not at all in 20% of the programmes. It is evident from the analysis that all the programmes were mainly knowledge-oriented, though other objectives were not neglected entirely.

ii) Adequacy of Content

Regarding the adequacy of content, it was found that about 25% of the programmes were over-loaded with content and in about 75% the content was adequate.

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iii) Format

In the present sample, use of different formats were considered. Table IV shows the distribution of IGNOU ETV Programmes according to different formats. It is evident from Table that formats of interview and discussion with experts were adopted in 35%, lectures with visuals graphs in 30% lectures with demonstration in 20% and documentary films in 15% of the programmes.

iv) Visual Aids (Quantitative)

Visuals, the key element in a format, help to a great extent in making a programme effective and receptive. The visuals used in the ETV programmes under study are given in Table V. It is evident that activities and real objects were used widely in a number of programmes, whereas two-dimensional and three-dimensional aids were not used in most of the programmes.

v) Visuals (Qualitative)

It is important to use an adequate number of visuals in a programme. It is also equally important to give attention to the use of these visuals in an effective way to serve the purpose to the desirable extent. Hence, the need for qualitative assessment of visuals. Table VI gives a clear picture the qualitative assessment of these programmes. It indicates that in about 65% programmes, visuals were fully clear, and in 50% of the programmes these were attractive. On the whole, most of the programmes were clear and attractive.

vi) Voice

Voice plays an important role in the communication process. Unless Voice is clear and its speed normal, it will make the entire programme ineffective and meaningless. Distinct voice is necessary for making the programme more effective. Table VII pertains to the clarity of voice and Table VIII the speed of the voice.

As regards the voice of the programmes under study, it was found that in about 90% of the programmes the voice was distinct and in only 10% of the programmes it was partially distinct. Similarly in 85% of the programmes it was found at a normal speed and in about 15% of the programmes it was a little fast.

vii) Language

As regards the language aspect of these programmes, it was found that in about 35% of the programmes, two languages (Hindi and English) were used. But in other programmes only one language (English) was used.

viii) Disturbances during presentation

While collecting the data, the investigators found transmission disturbances at the time of presentation of more than 40% of the programmes.

Major Findings

The major findings of the study are given below

i) As regards the objectives, knowledge objective was given more emphasis in 100% of the programmes, whereas due importance was not given to other objectives like application and understanding;

ii) Most of the programmes were adequate in content;

iii) In most of the programmes, the formats were lecture, discussion and interviews. In case of management topics, dramatization and problem solving approach were given due emphasis but demonstration and quiz were not given due emphasis;

iv) Interviews and discussions with experts, problem solving in management were found more interesting;

v) In 65% of the programmes, the visuals were quite clear;

vi) In 50% of the programmes the visuals were attractive;

vii) In most of the programmes (about 90%) voice was distinct and normal;

viii) Language media of the programmes were English (65%) and Hindi (35%); and

ix) Transmission disturbances were observed during the telecast of about 40% of the programmes.

Suggestions

i) The instructional objectives like understanding, application and skills should be given more emphasis while producing the programmes;

ii) Programme briefs should be announced with the names of their producing agencies prior to telecast. Otherwise, the topics to be telecast should be published in the newspapers;

iii) The programmes telecast once in the morning should be repeated in the evening;

iv) Objectives of various ETV programmes should be announced before the telecast;

v) Tele-clubs should be organised in all the educational institutions:

vi) Steps need be taken for smooth telecast without avoidable disturbances; and

vii) Various formats, particularly dramatization, role playing etc need be used in more programmes.

Table I : Selected IGNOU Programmes Telecast during February and March 1995

S.No.	*Title of the Programme*	*Subject*	*Day*	*Date*
1	Nutrition & Health Education	Health	Wednesday	08.02.95
2	Doppler effect	Sound	Wednesday	08.02.95
3	Management of Technology (Telematric)	Management	Friday	10.02.95
4	Measures of Dispersion	Statistics	Monday	13.02.95
5	Ancient time Library	History	Wednesday	15.02.95
6	Marketing	Management	Friday	17.02.95
7	Measures of Dispersion (*Apakaran ku map*)	Statistics	Monday	20.02.95
8	Rural poverty and its alleviation	Rural Development	Wednesday	22.02.95
9	Probability Fundamentals	Management	Friday	24.02.95
10	Probability Application	-do-	Friday	03.03.95
11	Preparation of Tables and Graphs	Statistics	Monday	06.03.95
12	Colon Scheme of Classification	Library Science	Wednesday	08.03.95
13	Management (Synthetic Fibre Marketing)	Management	Friday	10.03.95
14	Visualizing of T.V. Script	ETV	Monday	13.03.95
15	You and Your Food	Health	Wednesday	15.03.95
16	Creative Writing	Literature	Wednesday	22.03.95
17	Communication barrier	Management	Friday	24.03.95
18	Publicity of Article	Journalism	Monday	27.03.95
19	Assessment & Evaluation	Management	Wednesday	29.03.95
20	Human Resources Development in Human Organisation	Management	Friday	31.03.95

Table II : Distribution of IGNOU ETV Programmes according to their Emphasis on Different Assumed Instructional Objectives : Extent of Emphasis and Percentage of Programmes.

On Objectives	*To a great extent*		*To some extent*		*Not at all*	
	No.	%	No.	%	No.	%
1-Knowledge	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20	100	Nil	-	Nil	-
2-Understanding	2, 4, 6, 9, 12, 14, 16, 17, 18, 19, 20	55	1, 3, 5, 7, 8, 10, 11, 13, 15	45	Nil	-
3-Application	1, 3, 8, 10, 12, 14 15, 17, 20	45	5, 6, 7, 11, 13, 16, 19	35	2,4, 9, 18	20

Table III : Adequacy of content of the Programmes

Overloaded		Adequate		Inadequate	
No.	%	No.	%	No.	%
4, 7, 9, 10, 20	25	1, 2, 3, 5, 6, 8, 11, 13, 14, 15, 16, 17, 18, 19	75	——Nil——	

Table IV : Distribution of Programmes according to Different Formats

Sl. No.	Name of the Format	No. of Programmes	%
1.	Lectures with Demonstration	4,7,9,14	20
2.	Lectures with Visuals/Graphs	1,5,8,11,12,19	30
3.	Interview/Discussion with experts	3,6,10,13,16,18,20	35
4.	Documentary Films	2,15,17	15

Table V : Distribution of Programmes according to Visual Aids

Visuals	To a great extent		To some extent		Not at all	
	No.	%	No.	%	No.	%
Activities	3, 4, 6, 7, 9, 10, 13, 17, 18, 20	50	1, 8, 12, 14, 15 18	30	2, 5, 11, 16	20
Two-Dimensional	5, 11, 16, 18	20	1, 2, 4, 6, 8, 9, 12, 13, 15	45	3, 17, 7, 10, 14, 19, 20	35
Three-Dimensional	2,5	10	1, 3, 6, 8, 9, 10, 12, 14 15, 16, 17, 18	60	4, 7, 11 13, 19, 20	30
Real Objects	1, 5, 8, 12, 14, 15, 18, 17	40	2, 3, 6, 9, 10 13, 16	35	4, 7, 11, 19, 20	25

Table VI : Distribution of Programmes according to the use of Visuals

	Fully		Partially		Not at all	
	No.	%	No.	%	No.	%
Clear	1,2,3,4, 7, 8, 12,13,14, 15, 16, 19,20	65	5,6,9,10, 11,17,18,	35	Nil	-
Attractive	1,2,7,8,3,4, 9,12,14,15, 16.	50	5,6,7,10, 11,13,17, 18,19,20.	50	Nil	-

Table VII : Distribution of Programmes according to the clarity of Voice

Distinct		Partially Distinct		Indistinct	
No.	%	No.	%	No.	%
1,2,3,4,5,6, 7, 9, 10,11,12, 13,14, 15,16, 18,19,20	90	8,17	10	-	-

Table VIII : Distribution of Programmes according to speed of Voice

Quick		Normal		Slow	
No.	%	No.	%	No.	%
4,7,9	15	1,2,3,5,6,8,10, 11, 12,13, 14,15,16,17 18,19,20	85	Nil	-

Developing Complementary Attitudes

Dr. Kasturirangan, Chairman, Space Commission, Chairman, ISRO & Secretary, DOS delivered the Convocation Address at the sixty fifth convocation of Andhra University, Visakhapatnam. He said, "In this modern era, we have to develop a broader sense of complementary attitudes comprising scientific, technical, artistic and religious elements. This is the key for individual growth. Every individual has a great deal of creativity in him or her. One of the important tasks before any society is to provide opportunities for bringing out that creativity in each individual." Excerpts

The most important phase in one's life is the student phase because during this period one acquires the abilities to face the challenges of one's life. This is also the time during which one expands one's knowledge and builds the foundations for further learning. As you step into a career in this modern age after completion of formal education, you should be aware that learning has to be a continuing process throughout your life. The changes in science and technology are so rapid in recent times that it is difficult for any single person to fully appreciate all the developments. An example for such rapid advance in recent times is in the field of micro electronics, which is continuing to produce remarkable changes in computer technologies and communications. Similarly, the advances in molecular genetics have opened up enormous vistas for new developments in agriculture and health management. So, continuity in learning is essential if you have to overcome obsolescence and successfully face challenges of future life. What are the challenges which we have to face now and in the future?

If we analyse the relatively recent history of past one century, we understand that there have been bewildering changes all over the world. Several countries gained independence from their colonial masters and are trying hard to develop both socially and economically. You are aware that not long ago, our nation too had to carry out a historic struggle to gain independence and subsequently to achieve socio-economic development under a democratic polity. As Indians, we had been endowed with rich cultural heritage from ancient times. A highly evolved vedic culture flourished as long back as the first and second millennia before the birth of Christ. From those early times, noble thoughts emanated in our society and we could find many high points of civilisation. For example, the ancient utterance '*Ekam Sat Viprah; Bahuda Vadanthi*' indicates the realisation even in those early times that behind life and existence, there is a great force, a great presence which has been named differently by different groups of people, conditioned otherwise by different economic cultural and social backgrounds. We learnt that our ancient society nurtured a constant striving for achieving higher values in life — for example the emphasis for qualities like '*Upeksha, Mudita, Karuna, Maitri*' which mean that one should ignore evil, cultivate graciousness, develop love and do active good to all. With this background of culture and tradition which very few nations in the world can boast of, we wanted to shape our society, after independence, into a prosperous and civilised society. Our vision was to provide each citizen with means for meeting the basic needs like food, water, clothing and shelter. We wanted to ensure that we promote social justice and remove all those aberrations which were historical legacies and which deprived equal opportunities for all. We also wanted to provide access for all people for education, particularly for women and eradicate illiteracy. Further, we wanted to maintain peace and harmony in the society. The ancient India is known for maintaining religious tolerance and harmony among different religions. You know from history how tolerant were the ancient rulers of Andhra towards both Buddhism and Hinduism. Such tolerance is no exception to this place. This tolerance and harmony finds a very strong expression in the works of several Bhakti saints and Sufi saints of India in the medieval period. Only when such a harmony is maintained in a society, there will be conducive environment for its progress. Hence, when we started to renew our society after independence, we aimed to satisfy all the foregoing boundary conditions, and achieve material progress as well as spiritual development of our people in a democratic set up. What have been the results? If we compare the status in our country between now and preindependence era, we find that there had been tremendous development in various spheres such as, agriculture, education, health care, industry, commerce, transportation, communications, energy sources and so on. For example, in the field of agriculture, the major achievement we scored since independence was to achieve self sufficiency very soon through green revolution. The annual foodgrain production which was barely at a level of 55 million tons in 1947 has increased to 180 million tons in the recent years. In the field of education, we could see that literacy rate rose from a level of 16% at the time of independence to the present 52%. In a time span of four decades from 1950, 3 lakhs new schools have been opened and the enrolment during this period increased from 2.4 crores to 15.7 crores. Likewise, increased facilities for health care enhanced the average life expectancy from 30 years during the time of independence to the present level of about 60 years. In industrial arena, India made great strides and today Indian industry is highly diversified and possesses considerable technological strengths. There has also been rapid growth in infrastructural facilities like roads and communications. Yet, all these magnificent developments are not adequate to realise all our past visions and dreams. We still have a lot of work to accomplish in this direction. So, building of a self-sustaining, vibrant and harmoniously developed society is the biggest challenge of our time. Whatever may be your field of work — be it a business, a service, an industrial profession or research — if you can do something to contribute to build a good society, your life will be more purposeful.

Let us now turn our attention to the other future challenges that confront us — at global as well as national levels. Growing population is one of the biggest challenges. After a very long period since the origin of our species on earth, the global human population reached a level of 10 millions, about 10,000 years ago. This grew rapidly to 2.5 billion by 1950. Within a short span of further 40 years, it has more than doubled to 5.5 billions. This increase in population had been the result of improved health care which lowered infant mortality rates and which sustained high birth rates. However, the increasing trend in population cannot be reversed in a short time. Even if actions are taken to bring down the birth rate it takes several decades or even some generations to lower the death rates so as to arrest population growth. For example, even if the fertility is brought down from the current global replacement average of 3.3 to 2.1 children per woman in the next 60 years, that will add atleast 11 billions to global population before levelling off at the end of 21st century. This magnitude of population addition, which will particularly occur in the developing countries, would have enormous implications for supply of basic needs and also for sustaining natural environment.

Throughout history and particularly in the present times, we have been watching that human activities have been contributing to environmental degradation. The increased population growth has been responsible for accelerating the use of natural resources, production of large amount of wastes and also degradation of environment. Our efforts to increase the production of food, clothing, shelter, comfort and recreation to meet the needs of growing population put tremendous strain on the natural resources and environment. These are further worsened by the consumption habits of wealthy nations, certain applications of new technologies and particular patterns of social organisation and resource management. Hence we are running the risk of bringing about irreversible changes due to the pressures of increased population. These changes could be of significant magnitude. There are already several indicators of environmental stress such as growing loss of bio diversity, increased emissions of carbon dioxide and other green house gases, the upward trends of deforestation, acid rains, loss of top soil, shortages of water and fuel wood and so on. Added to this, there had been rapid exploitation of non renewable resources. The developed countries which account for 23% of world population have been responsible for consuming the largest part of minerals and fossil fuels. Thus, environmental problems arise from various reasons such as the direct pollution from increased energy uses and other industrial activities, inappropriate agricultural practices, population concentrations and inadequate environment management. Normally priority is given for solving immediate economic problems without due regard to environmental problems. This causes environmental damages which later pose serious problems for health and also become road blocks for future economic growth. Redressing such damages in environment may not be possible and even if it is feasible, it is going to be very expensive. A standing example of how expensive is the loss of an old tree is found in the following statement, which I quote :

> "A tree that lives for 50 years generates Rs. 5.3 lakhs worth of oxygen, recycles Rs. 6.4 lakhs worth of fertility, facilitates Rs. 6.4 lakhs worth of soil erosion control, creates Rs. 10.5 lakhs worth of air pollution control and provides Rs. 5.3

lakhs worth of shelter for birds and animals. Besides, it provides flowers, fruits and lumbers. So, when one tree falls or is felled, the city loses something worth more than Rs. 32 lakhs." (unquote)

The relation between the population, economic development and natural environment is quite complex. We observe that in developed nations, people have been striving to know with 'how much' they can live. In contrast in developing countries, we are trying hard to know with 'how less' we can live. Nevertheless, actions are needed from both sides to strike harmony between development and natural environment. Environmental impacts depend upon a host of factors such as rate of resource use, distribution of population among rural and urban areas, level of poverty and lack of economic opportunities, which in turn stimulate environmental degradation by encouraging exploitation of marginal resources. However, it is to be noted that development is the legitimate expectation of less developed countries. Hence at global level, greater understanding is necessary. Effective actions are to be taken for protection of environment on the one hand and providing avenues for rapid economic development in the poorer countries on the other hand. There are several problems in developing countries which are to be tackled. These include wide spread poverty, increased number of aged persons, limited educational opportunities for large groups of people, scarce resources for investment and non-availability of technologies. All these problems can be tackled with some level of confidence only if population growth is arrested and in addition efforts are made to achieve sustainability of natural world. Such a sustainability demands goals, as identified by the Global Possible Conference (1984), such as (a) demographic transition to a stable population (b) energy transition to high efficiency without environmental degradation (c) resources transition to enhance and use the products of nature judiciously without depleting capital and (d) economic transition to sustainable growth and broader sharing of its benefits. In achieving the sustainability, there is a role for each segment of society, namely, voluntary organisations, the Government and people in general. There is also a great scope for developing and using new technologies which are environment friendly.

I would now like to touch upon another major challenge of the future at a global level, namely, the process of development under an emerging world economic order. Again looking at the not so distant past, we discover that the characteristic features of the post world war era were the emergence of numerous independent nations and rapid impact of scientific and technological revolution. In such a milieu, one witnessed the active engagement of many world nations in a fierce competition for economic gains. The globe presented a division between those countries, who had taken advantage of their early entry in industrial revolution and stood to gain by rapidly adding wealth to their economies and the other group of nations, which were overburdened by rapidly growing and high populations, predominantly agrarian economies and constrained by poverty and lack of technological resources. Differing political ideologies also created divisions and alignments among nations, and influenced their economic and trade relations. The wealthy nations found sizeable markets for their manufactured goods in developing countries, who often supplied them with minerals and raw materials at low value. As resource technologies were under possession of large multinational corporations belonging to developed countries, they had a large share of world trade. Because of this economic power, the international economic system was dominated by those countries. The rules, regulations and international institutions of trade, money and finance of the international economic system were greatly influenced by them. Although a few developing countries were able to succeed against such a domination, several developing nations are not adequately equipped to deal with such a situation. The experience in the world shows that the free play of economic forces tend to produce growing amount of inequality both among and within nations. This gap is also further accentuated by rapid advances in technology. In the last few years, major transitions are apparent in the world scene, and these included the end of cold war, an increasing trend of globalisation of markets in the developing world and the conclusion of Uruguay round of Trade negotiations which culminated in the establishment of a World Trade Organisation. However, in order to succeed in such a global environment, a developing country needs to evolve proper responses. In general, globalisation encourages greater access to new technologies and inventions. Similarly new products and materials produced through innovations reach the markets in all countries rapidly. Upon globalisation, several domestic industries are compelled to extend

(Contd. on page 22)

HUMAN RESOURCE

PER CAPITA SOCIAL SERVICE EXPENDITURE AND GRANTS FROM CENTRE

	Per Capita Social Service Expenditure			
	1988-89 (A/c)	*1989-90 (A/c)*	*1990-91 (A/c)*	*1991 (R*
All States	144.12	148.78	155.38	151
High Income States				
Gujarat	183.04	174.62	177.85	178
Haryana	194.68	183.12	183.27	178
Maharashtra	188.80	186.98	182.33	184
Punjab	246.80	218.52	200.88	219.
Middle Income States				
Andhra Pradesh	141.73	152.55	148.25	144
Karnataka	155.06	152.10	155.91	169
Kerala	179.42	180.79	195.69	179.
Tamil Nadu	152.75	185.66	204.65	196.
West Bengal	125.26	131.73	159.48	144.
Low Income States				
Bihar	90.11	96.91	102.18	99.
Madhya Pradesh	122.47	124.39	195.41	133
Orissa	119.54	127.31	124.07	147
Rajasthan	148.51	146.47	165.89	161
Uttar Pradesh	95.69	109.73	116.88	101.
Special Category States				
Assam	149.74	140.34	147.06	138.
Himachal Pradesh	372.12	320.15	334.34	353.
Jammu and Kashmir	333.10	327.27	338.49	349.
Meghalaya	325.94	354.41	364.18	402.
Manipur	442.18	427.11	353.89	325.
Nagaland	701.00	689.45	624.00	543.
Tripura	408.40	384.19	382.15	370.

Notes : Grants from centre relate to plan and non-plan grants.

The classification of states in terms of high, middle and low per capita income has been made on the basis of latest available figures of net state domestic product released by the states.

OPMENT DATA - 4

CAPITA) FOR TWENTY-ONE MAJOR STATES AT 1980-81 PRICES

(Rupees)

3	*Per Capita Grants from Centre to States*				
	1988-89 (A/c)	*1989-90 (A/c)*	*1990-91 (A/c)*	*1991-92 (RE)*	*1992-93 (BE)*
	64.33	51.50	67.23	73.91	70.82
	52.43	24.29	31.45	40.88	43.49
	57.53	29.84	40.18	44.88	48.50
	43.12	39.72	45.86	40.92	40.22
	52.59	30.49	40.02	68.50	61.64
	44.62	37.15	53.32	51.77	53.84
	40.01	30.57	38.30	35.94	49.77
	39.48	31.28	54.77	60.17	57.71
	43.33	38.40	46.67	44.04	41.63
	55.51	29.31	48.20	47.87	53.67
	39.81	26.96	40.64	47.64	48.16
	51.65	36.94	58.88	74.06	66.31
	85.28	70.83	85.08	98.48	106.72
	82.96	56.39	87.51	86.18	86.44
	46.26	39.61	68.47	66.67	55.88
	125.59	110.44	106.96	192.31	178.71
	356.43	330.46	337.30	378.42	326.61
	322.04	321.56	349.92	466.94	402.28
	578.06	568.18	575.00	573.50	521.28
	647.94	602.83	605.39	588.32	510.95
	1260.90	1075.27	1014.27	1096.45	935.08
	519.24	488.42	–490.00	497.00	493.89

rce : S.P. Gupta and A.K. Sarkar. Fiscal Correction and Human Resource Development : Expenditure at Central and State Levels. *Economic and Political Weekly*. 26 March, 1994.

(*Contd. from page 19*)

their arena of operations and transformed as multi-national enterprises. There will be greater flow of technological information at international level. Domestic industries will also have to compete with their counterparts at global level and are required to produce products of international quality which demands a great degree of innovative approach in their business. In terms of Science and Technology, a major response which is required from a developing country in the context of globalisation is the need for long term policy and long term approach to science and technology. A very important requirement would be strong coordination among universities, industries, research institutions and government. Also, greater level of cooperation between public and private sector becomes essential. Each developing country has to discover a niche for their industries in the global market. In chosen areas, industry should be strongly supported by the government, public, educational and R&D institutions for establishing leadership or core competence. In India, we have to accord priority for such potentially successful areas such as software, textiles and so on. Another field of major response to globalisation will be in the education sector and particularly in continuing education. Technology evaluation, particularly addressing contemporary overseas technologies, is a necessary step to promote effective diversification. While I would not like to go on mentioning all such measures, I would end with underscoring importance of one more area, namely, standardisation of industrial products according to a uniform standard. In short I would like to summarise that increasing globalisation of trade and markets poses a very big challenge for several countries including our own. They also open up several new opportunities not only in industry and services sectors but also in several other fields like agriculture, education and science and technology.

Role of Science and Technology

While Science and Technology alone cannot solve the problems posed by population growth, wasteful resource consumption and poverty, it can play a crucial role for increasing income and for educating public and policy makers so that both government and public could act more effectively. Science and technology could also develop new options for limiting population growth, protecting environment and improving quality of life. The scientists could work to develop strategies and tools for improving education, developing human resources and to help tackling major problems of society in fields like health, energy, transportation and communications. Science and technology can also play a crucial role in achieving sustainable developments in fields like agriculture, water resource management and so on. Science can help to cultivate a sense of purpose as much as art or religion does. If we look at the evolution in this universe from big bang to the present intelligent human beings, we see a pattern and bountiful creativity in nature. However, with the increased level of industrialisation and mechanisation, there are changes in the social framework. There have been forces to increase alienation and to rob the sense of purpose in an individual. One of the greatest requirements is to restore this sense of purpose. We should find social and industrial organisations where most people should feel responsible for what is going on. There is tremendous scope for inventiveness in creating such systems. In this modern era, we have to develop a broader sense of complementary attidues comprising scientific, technical, artistic and religious elements. This is the key for individual growth. Every individual has a great deal of creativity in him or her. One of the important tasks before any society is to provide opportunities for bringing out that creativity in each individual. Hence, it is necessary to develop new creative outlets which are not only relevant for scientists and artists but for every member of the society.

I tried so far to draw on a broad canvas the relationship among population, development, environment and the role of science. I would now like to dwell upon the picture in India in the next few decades in terms of two of its most important resources, namely, land and water resources.

One of the major factors which diminished the effect of tremendous developments which took place in post independent India is the rapid growth of population. In 1951 soon after we became independent, our population was about 360 million. This rapidly grew to a level of 850 million by 1991. This represents about 15% of the total world population. Even if the measures for controlling the population are vigorously pursued, the population experts predict that our population will reach a level of 1.3 billions by the year 2025 and eventually stabilize after 2070 at a level of 1.7 billions. It would be pertinent to see how the future scenario looks like, with respect to development in the face of this burgeoning population. India has been facing several challenges to maintain its land productivity by overcoming problems like soil erosion due to various factors such as flooding, deforestation, etc and also problems of increase in soil salinity, alkalisation and loss of micro nutrients. There had been an increasing level of environmental degradation due to industrial effluents. Urban population in India has been steadily growing and is expected to exceed 350 million by 2001. Of these one third of them will inhabit slums unless remedial measures are taken. Out of 329 million hectares of total land area of India, it is estimated that ultimately 190 million hectares are cultivable (comprising 113 million hectares of irrigable area and rest rain fed). In order to feed the increased level of population when it reaches stability of 1.7 billion, it is necessary to produce about 350 million tons, which establishes the imperative need to increase the yield. The average yield in India is 1.7 tons per hectare (for cereals) as compared to 3 to 4 tons per hectare in some countries like USA and Egypt. However, by adopting several new measures we should try to increase yield in our country. It would however be too simplistic to assume the possibility of manifold increase in the yields on a sustainable basis. Several inputs of scientific, social and economic nature are necessary. Management of water resources presents even greater challenges than land resources management in future. Out of the 420 million hectare meters of water contributed annually by rain, snow and inflows from the rivers flowing in from other countries, 70 million hectare meters evaporates immediately from soil, 165 million hectare meters goes to soil moisture, 50 million hectare meters charge into ground and remaining 135 million hectare meters are manifested as surface flows. This provides an ultimate usable water potential of 112 million hectare meters. Under present pattern of production, this can produce food grains to a level of 258 million tons, whereas we will require 347 million tons to feed the population level of 1.7 billion persons assuming a per capita need of 204 kilograms, as at the present time. If a higher per capita grain consumption is to be assumed, for example 279 kgs as in case of Chinese, we would be required to produce 474 million tons. Hence the situation with respect to management of water resources is quite serious. Several measures to conserve and increase the efficiency of the use of water are to be taken.

In each of these areas one cannot move forward unless we bring to bear scientific methods along with social action. Solutions at grass root level should include scientific inputs from modern fields like bio-technology and space technology. Space technology for example can provide several vital inputs to assist land and water resources management.

I would like to give you an example of how the inputs from space technology could transform the scene of resource management. In our space program, while we are striving hard to develop excellent technology for a space system, we are equally or more concerned with how space technology can be applied for solving grass root level problems. In a project which we undertook in the Vanjuvanka water shed of Ananthapur district in this state, the imageries obtained from space have been used to study the land and water management problems. You know that this district has erratic rainfall with high evapotranspiration. Due to meagre surface water resources available, there was over-exploitation of groundwater. The soil in the region has eroded and become saline/alkaline. For addressing needs of such areas, Department of Space initiated, with involvement of local authorities, a larger mission called 'Integrated Mission for Sustainable Development (IMSD)'. In this, resource problems are studied using space imageries at each watershed level, along with relevant socio-economic data. Modern computer based tools such as Geographic Information Systems are employed to derive prescription for improving the conditions. The implementation of the prescription made under IMSD at Vanjuvanka has resulted in construction of 32 check dams, 1,200 hectares of soil bunds and tank silt application over 500 hectares. The check dams have received 8 to 11 fillings during 1993 monsoon and the resultant recharge of groundwater caused a rise in water-table by 1 to 4 meters in the dug wells. Dry wells have also received water and the borewell yields have increased; thus crops like groundnut and mulberry have now been raised. It is pertinent to note that this improved situation resulted in the reversal of migration of people from their rural lands. They have now been taking multiple crops. The success we scored at Vanjuvanka and a few other places prompted us to extend such application in 157 districts in our country.

I have quoted this example to show that there are numerous opportunities along with formidable challenges in our society. I have great faith in the capabilities of our younger generation which I intensely experienced over the last two decades of my career in the Space Program. I am sure that this great potency will be brought to bear in shaping our society into an economically prosperous and socially vibrant society.

Excerpts from the Report

by

M. Gopalakrishna Reddy
Vice-Chancellor
Andhra University, Visakhapatnam

The University has during this period started the following courses :

M.P.Ed. summer course in Physical Education for inservice teachers; P.G. Diploma in International Business; P.G. Diploma in Accounting and Software; P.G. Diploma in Human Resource Development and Industrial Harmony; P.G. Diploma in Transport Management; M.A. Degree course in Urdu; M.A. Degree course in Linguistics; and M.L. Course in Dr. B.R. Ambedkar P.G. Centre, Etcherla.

The University is also starting from this academic year three new courses in the Department of Marine Living Resources: one Master's Course in Coastal Aquaculture and Marine Biotechnology and two diploma courses in Coastal Aquaculture and Coastal Zone Management.

The University has during 1994-95, sanctioned 31 new Degree colleges, of which twenty-six offer Arts, Science and Commerce, three Law, and one Physical Education. Of the 31 colleges sanctioned twelve are located in rural areas. The University has also permitted two colleges to start M.B.A. and five colleges MCA.

The University has formulated the syllabi for restructured courses and 20 out of 26 colleges were permitted, during the academic year 1994-95, to offer restructured courses. Among the courses sanctioned in combination with traditional subjects, mention may be made of Computer Applications, Pre-School Education, Local Self-Government, Office Organisation and Management at the B.A. level, Computer Science, Electronics, Instrumentation, Horticulture, Fisheries, Applied Nutrition and Public Health, Micro Biology and Medical Laboratory Technology and Nursing at the B.Sc. level and Management and Accountancy and Computer Awareness at the B.Com. level. Vocational courses have also been in great demand and 6 colleges were permitted during the year 1994-95 to offer Computer Applications, Electronic Equipment Maintenance, Geo-Exploration and Drilling Technology, Travel and Tourism Management, Industrial Fish and Fisheries, Tax Procedure and Practice.

Several of our departments have received sanction for major and minor research projects and for modernisation of the library facilities and the total value of these grants sanctioned by the AICTE, UGC, DOD, Government of Andhra Pradesh and NABARD amounts to Rs. 4.91 crores. Among them are : Rs. 2.15 crores for starting a Centre for Coastal Aquaculture; Rs. 20 lakhs for a project on Environmental Impact Assessment of Brackish Water Aquaculture in the Department of Marine Living Resources; Rs. 19.65 lakhs for a project on plant molecular and agricultural bio-technology 'Genetic and Rflp analyses and salinity tolerance in Sorghum'; and a project of Rs. 15 lakhs on 'Diseases as a function in Brackish Water Farming' in the Zoology Department.

The Govt. of Andhra Pradesh has sanctioned Rs. 12 lakhs for starting a Centre for Rural Development for the study of Integrated Development of Godavari Valley.

A Centre for Computer Aided Design costing Rs. 6 lakhs has been set up in the Department of Civil Engineering with a grant of Rs. 3 lakhs from the Visakhapatnam Port Trust, to provide precise designs with the help of computers.

Among the projects sanctioned by the AICTE are : a project of a value of Rs. 15.38 lakhs for Development of Special Surface Coating for Inhibition of Corrosion on Different Environments — a joint project with Anna University; two projects for the Institute of Transport Management Studies of a total value of Rs. 12.5 lakhs.

The Geology Department obtained sanction from DST and AICTE for a project to study Coastal Sedimentary processes and mineral occurrences in the near shore zone of Kalingapatnam and Groundwater Recharge and Management studies in crystalline rock aquifers in parts of Vizianagaram and Srikakulam Districts.

The Visakhapatnam Port Trust has entrusted to the Resource Mobilisation Cell, a consultancy project, at a cost of Rs. 14.80 lakhs to study environmental aspects of Visakhapatnam, in and around the Port.

The National Bank for Agricultural and Rural Development (NABARD) has instituted

NABARD Chair Scheme Unit in the Department of Cooperation and Applied Economics with effect from 1994 for a period of five years to encourage applied and empirical research of high standard.

The V.S. Krishna Library is being modernised with a UGC grant of Rs. 50 lakhs. This amount will be used (i) for modernisation and automation of the library, (ii) for networking with departmental libraries and National INFLIBNET, and (iii) for acquiring books worth Rs. 26.10 lakhs. The library has introduced a monthly bulletin under the title 'Current Awareness Service'. Abstracts of theses for the years 1972-1994 have also been prepared. The Library has acquired the latest automatic machinery to modernise the bindery.

Andhra University Press and Publications has brought out the Eighth volume of the Telugu Etymological Dictionary and the complete set of eight volumes is now available in the University Press. A volume titled 'Challenges and Opportunities' containing the Convocation Addresses delivered at the Andhra University, from the first Convocation Address delivered by Dr. S. Radhakrishnan in 1927 to the one in 1994 has been brought out by the University Press. The volume has this morning been kindly released by our Chancellor.

The University Grants Commission sanctioned Rs. 10 lakhs for the construction of a new building and extended the tenure of the SAARC Centre for another five years up to 31st March, 1998. The Academic Staff College has during 1994-95 conducted 14 refresher and orientation courses, taking its tally to 77 since its inception eight years ago. The student enrolment in the School of Correspondence Courses crossed the 45,000 mark. In order to further strengthen the student support services network, two more study centres are started at Narsipatnam (Visakhapatnam District) and Bestavaripeta (Prakasam District). These study centres act as nuclei of the academic activities, such as conduct of week-end class programme, contract programme, student counselling, etc.

The Population Research Centre of the University has completed the major research project on "National Family Health Survey — A.P." which was sponsored by the US AID and Government of India.

A 4-Day Trainers' Training Workshop was conducted on AIDS by the NSS Cell for selected NSS Programme Officers in the University area. Ten University students were deputed to participate in the Inter-University Home Stay Cultural Exchange programme at Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni, Himachal Pradesh. The Department of Adult and Continuing Education imparted training and lent resource support to the literacy activities of O.D.A., Railways, District Administration in the Andhra University area, Zilla Saksharatha Samithi, and other voluntary organisations.

The Department of Geophysics, Andhra University and Indian Institute of Geomagnetism, Colaba, have entered into an agreement to conduct collaborative research in the field of earth's magnetism and geomagnetic variations.

The University has signed a Memorandum of Understanding for an exchange programme involving teachers and students, with Armstrong State College of Georgia University, U.S.A.

The University hosted the 39th ISTAM (Indian Society of Theoretical and Applied Mechanics) Conference, the 49th All India Political Science Conference, the 4th Marine Archaeology Conference and acquired a valuable collection of 500 books relating to maritime history from the Scindia Steam Navigation Co. of Bombay.

The South Zone Inter-University Youth Festival was organised. Over 800 participants from 36 Universities of South India participated in the festival. The Andhra University team participated in the National Youth Festival at Gulbarga. Summer Coaching Camps in Weight Lifting, Volley Ball, Cricket, Foot Ball and Hand Ball were revived from the summer of 1994 and held at the Andhra University in June, 1994.

The University reacted promptly to the gas blow-out at Pasarlapudi in East Godavari District and conducted a survey to assess the environmental and socio-economic effects of the blow-out.

AUCET 95 — the sixth in the AUCET series — LAWCET and MBACET have been completed on time and the University will shortly conduct the first Research Common Entrance Test for admission into M.Phil. and Ph.D.

TO OUR READERS

Knowledgeable and perceptive as they are, our contributors must not necessarily be allowed to have the last word. It is for you, the readers, to join issues with them. Our columns are as much open to you as to our contributors. Your communications should, however, be brief and to the point.

CAMPUS NEWS

World Population Education Day

The Population Education Resource Centre (PERC) of the Gujarat Vidyapith recently organised a Population Education Week to mark the World Population Day declared by U.N. Mr. Nitin Patel, Gujarat Minister of Health & Family Welfare inaugurated the celebrations while Mrs. Bhavna Dave, Mayor of Ahmedabad Municipal Corporation was the chief guest on the occasion. Prof. Ramlal Parikh, Vice-Chancellor, presided.

Prof. Parikh in his address stated that Population issue was not merely a biological issue but a issue which required a widespread mass-education through non-formal ways. Programme of Population Education was vital in creating the understanding of population issues in the context of social change. It required inculcation of appropriate attitude to adopt a small family norm as a way of life, he said. Education of women was very crucial in this context, he felt and said the eradication of illiteracy was a condition precedent for containing population explosion. In Gujarat State, he said, increase in literacy rate by 12% resulted in substantial decrease of population growth rate. The universities had a great obligation to the society in aiding to transform itself to a culture and civilisation of small family. Its social implications were Literacy for all, Late age of marriage, Better health care of child & mother, Reduction in infant mortality rate, Gender equity, Empowerment of women in decision making, etc.

To mark the occasion, programmes of Film shows, elocution contests, poster-contests, public lectures, exhibitions, etc were organised in its rural campus also. Local surveys to determine the fertility rate of the villages in which its rural service colleges are located, were done by the students.

The PERC of the Gujarat Vidyapith announced that it would establish a documentation centre on population issues. The centre has also instituted a course on Population Education in B.Ed. & M.Ed. courses as well as in M.Phil course in Adult Education.

Science Subjects in Hindi Medium

The Indira Gandhi National Open University (IGNOU) will soon start science and technology subjects in Hindi. Declaring this at a workshop organised by the Hindi Cell of IGNOU, Pro-Vice-Chancellor Prof. Janardhan Jha informed participants that the School of Computer and Information Science had started preparing course material in Hindi.

It was only natural that the use of the mother tongue would be most effective in imparting education, he added. This was also in keeping with the status of Hindi as the lingua franca of the Union, and while various States had different languages, only Hindi could be the link language, Prof. Jha averred.

Former Director of the Central Hindi Institute, Prof. Suraj Bhan Singh, pointed out that language developed with knowledge and over the years, with different subject area developing in different languages. That our ancient literature was written in different languages bore testimony to this eclectic phenomenon, he added. It was difficult to find a parallel to this in any other society, he said.

Scientific knowledge was received from Western countries and there was a dependence on their language for technical words, Prof Singh said.

Prof Singh expressed the view that Hindi could be successful as a medium of education only if realistic writing could be attempted in the language instead of mere translation. It was only through the use of Hindi that the country could communicate and comprehend clearly and simply, he opined.

Computer Applications in Libraries

The Gulbarga University, in collaboration with the INFLIBNET, organised a Training Course on Computer Applications to Library and Information Services.

Inaugurating the course, Mr. Sudhir Krishna, Divisional Commissioner, emphasised the need for utilizing the latest technology for offering better library services. Dr. N. Rudraiah, Vice-Chancellor, who presided, highlighted the need for training the college librarians as part of the university's programme to link all the college libraries in the Gulbarga City.

The course contents included: Introduction to computers; Introduction to DBMS; Installation of CDS/ISIS version 3.07; Database creation using Data Definition Services (FDT, FMT & FST); Data Entry; Database Modification; Editing of data; Formatting language commands (PFT); Searching the database; Sorting and Printing etc; and Demonstration of ILMS software being developed by INFLIBNET.

About 25 participants from university library and various colleges participated in the course.

National Seminar on Technical Education

A National Seminar on "Planning and Management of Technical Education" would be held at the Jawaharlal Nehru Technological University, Hyderabad on 19-20 August 1995. The seminar is sponsored by the All India Council for Technical Education, New Delhi.

The objective of the seminar is to examine the present scenario of planning and management issues related to technical education, analyse the strengths and weaknesses of the existing system, and suggest improvements.

The topics proposed to be discussed at the seminar include (i) Planning and Management : Coordinated development of Technical Education; (ii) Role of University, State Govts. and Professional Societies in Technical Education; (iii) Accountability of Technical Education Institutions/Teachers; and (iv) Academic Planning, Quality Assurance, Financial Management and Resource Mobilisation.

Further details may be obtained from Dr. C. Radhakrishna, Coordinator of the Seminar & Prof. of Elect Engineering, J.N.T.U., Mahaveer Marg, Hyderabad - 500 028.

Information Industry Promoter-User Interaction

Bengal Library Association, Calcutta, proposes to organise a Joint Session of the 2nd Information Industry-Promoter-User Interaction Meet and 4th National Users Meet Online/CD-ROM on December 21-24, 1995. The Meet is promoted & sponsored by the Department of Scientific & Industrial Research, Ministry of Science & Technology. The meet will focus on National Information System for Science & Technology, commercialisation of information products and services, and special demands on the information sector of the Indian economy.

Matters of common interest proposed to be discussed include : Assessment of existing scenario, Perception of users demand and thrust areas, Popularisation of the use of modern information tools like the non-line and optical technologies, Facilitation of exchange of experiences, Demonstration of information products and services to the peers in the field and the potential users community, and Evolution of strategies and formulation of action plans for the development of an Integrated Information market in India.

The Meet is intended for the executives of organisations such as: Industrial, financial & business information companies/organisation; Institutions generating S & T information; Providers of E-mail & value-added telecom services; Vendors of CD-ROM and on-line services; Publishing houses; Agencies promoting and supporting development of information systems, services and network; Professional bodies of information workers and users of information like Scientists, Library & Information Centre Managers, Industries, News Agencies, Financial Analysts, Statisticians, IT professionals, IT Hardware-software Manufacturers, Vendors, Technologists, Corporate Houses, Service Organisations, Consultants, Stock Brokers, Investors, Economists, Econometricians, Management Professionals, Government Decision Makers, and Tourism, Travel and Hospitality Industry.

Further details may be obtained from Mr Vimal Kumar Varun, Senior Scientific Officer, National Information Systems for Science & Technology, Department of Scientific and Industrial Research, Technology Bhawan, New Mehrauli Road New Delhi-110 016, India.

World Conference on Small Business

The 40th World Conference was organized by the International Council for Small Business from 18-21 June, 1995 at Sydney (Australia). The Conference covered some important topical areas in the field of education such as Business Education, Role of Technology in Education, Unemployed Youth Enterprise Projects. In his paper relating to Small Business in India, Prof. L.N. Dahiya, Pro Vice-Chancellor, M.D. University, Rohtak (Haryana), emphasised that the small business assumed greater importance in the context of Indian Economy in view of its liberalisation policies. He suggested various workable solutions to enhance the potential of Small Business in India. He said that India should emulate Haryana State in the matter which was poised for rapid expansion. Universities and research institutions should further be involved in the development of small business, he added.

The Conference was attended by over 400 distinguished people from universities, Business Executives and Administrators from all over the globe.

BE in Polymer Science & Technology

The advisory committee of Delhi College of Engineering is reported to have decided to introduce a new course in B.E. (Polymer Science and Technology). The course duration has been reduced from 5 years to 4 years to bring the programme in line with other Universities like Jamia Milia, Aligarh Muslim University. The advisory committee also approved institution of a gold medal to be given to the best girl student of the college. Prizes have also been instituted for students from rural background having high proficiency in academic life and exhibiting high sense of moral value.

Project Based Fellowships

An innovative approach to research fellowships is likely to be introduced by the Distance Education Council. This was revealed by Prof. Ram Takwale, Chairman of the Council and Vice-Chancellor of the Indira Gandhi National Open University (IGNOU). Instead of calling the fellowships junior and senior fellowships as done by other institutions in the country, they would be designated in terms of the time taken — short term, medium-term and project based. It is hoped this would make them all project based in the sense that they would all have a definite time span. The duration would also determine the nature of the topic chosen for the research work.

Another innovative aspect is that all the open universities have come together to develop a pool of researchable topics. Research fellowships will only be available for work on one of the topics from the pool.

Ms Kolbe Visits Delhi University

Ms Helen Kolbe, Unesco expert visited the Population Education Resource Centre of Delhi University to evaluate the materials produced and procured under Population Education unit of the Department. During hervisit she held discussions on the utility, frequency and quality of materials with Mr. Rajesh, Project Officer. She said that she had visited four developing countries including India regarding the evaluation of performance of Population Education materials and further contribution of UNESCO and UNFPA. She said that UNESCO and UNFPA would further strengthen the activities in all the sectors including higher education sector.

Mr. Rajesh informed her that UNFPA supported Population Education in all the three sectors i.e. Non Formal Education Sector, School Education Sector, and Higher Education Sector.

The University Grants Commission has set up 12 Population Education Resource Centres to strengthen Population Education activities in colleges and universities. Delhi University centre, set up in 1985, produced a number of learning materials (Print & Audio-Visual). During 1994-95 it conducted orientation courses for 250 College Principals and 500 Lecturers and Readers including Population Education club Incharges. Recently, the centre brought out a Newsletter on Population Education and Extension lecture series-I for the teachers and students under the service area universities.

News from Agricultural Universities

Sir Chhotu Ram Memorial Lecture

Dr. R.S. Paroda, Director General, Indian Council of Agricultural Research (ICAR) called upon the agricultural scientists to divert their emphasis on the vast agricultural potential that still remained to be harnessed as in the coming years agriculture would certainly face challenging situation on ecological, global, economic, energy and employment fronts. He said that though Indian agriculture had kept pace with the population growth yet in view of the globalisation of markets and new economic policies we had not succeeded in finding the best alternative that could enhance productivity *per se* to ensure the monetary returns per unit area input and time. Dr. Paroda was delivering Sir Chhotu Ram Memorial Lecture at Chaudhary Charan Singh Haryana Agricultural University in Hisar recently.

He said that in the process of development, as we march into the 21st century, economic consideration would continue to be viewed with greater optimism and edge. Hence generation of first rank technology and its effective dissemination for realisation of a competitive quality of produce should be our first priority. He said that our future research programmes should ensure sustainability of production system and developing technologies suitable for different agro-climatic and socio-economic conditions of the country. Dr. Paroda emphasised that mere generation and dissemination of need-based technology was not enough. Generation of employment for rural poor and landless by guiding them to adopt agricultural allied professions and agriculture-based professions should form our priority, he added. Dr. Paroda released a commemoration volume on Sir Chhotu Ram on this occasion.

Dr. S. Arya, Vice-Chancellor, CCSHAU, conferred Sir Chhotu Ram National Award for 1995-96 on Dr. R.S. Paroda for his outstanding contribution in the development of agriculture. Dr. Arya said that by developing fourteen high yielding varieties of different crops and contributing 13 books and more than 200 research articles in journals of repute, Dr. Paroda had given definite new direction to Indian agriculture to make it far more productive, remunerative, sustainable and competitive.

Paying rich tributes to the memory of Sir Chhotu Ram, Dr. Arya urged the scientists to take new technologies to the maximum number of farmers at the grassroot level so that this University could come up to the dreams of Sir Chhotu Ram.

News from UGC

Countrywide Classroom Programme

Between 8th August to 22nd August, 1995, the following schedule of telecast on higher education through INSAT-ID under the auspices of the University Grants Commission will be observed. The Programme is presented in two sets of one hour duration each every day from 6.00 a.m. to 7.00 a.m. and 1.00 p.m. to 2.00 p.m. The programme is available on the TV Network throughout the country.

Ist Transmission

6.00 a.m. to 7.00 a.m.

8.8.95

"Bookfare - I"

"Modern Techniques of Map Making - Part II"

"Image of a Girl Child"

10.8.95

"Folk Rhythms - Part II"

"English Romantic Poetry - Part I"

"Yours Sincerely"

12.8.95

"Geometry Made Simple"

"Negotiable Instrument - Part I : Promissory Note and Bill of Exchange"

"Effects of Noise Pollution on Health"

13.8.95

"Efficient Lighting"

"Coal : New Ways to get and use it"

"The Week Ahead"

15.8.95

"Special Programme on Completion of 11 years of Countrywide Classroom"

"Heritage Conservation : Preserving Buildings of the Past"

"Lifeline Express"

17.8.95

"Microwave Antenna - Part I"

"Rainfall and Water Resources - Part I"

"English Romantic Poetry Part II"

19.8.95

"New Horizons - Part XXVI"

"Algebraic Geometry"

"Negotiable Instrument - Part II : Cheque"

20.8.95

"Career Counselling : Applied Arts"

"Current Affairs : Economics & Commerce - Part X"

22.8.95

"Question Time - XVII"

"Naturopathy as an Alternative Medicine"

IInd Transmission

1.00 p.m. to 2.00 p.m.

8.8.95

"Copper Chemistry"

"10th General Conference of International Association of Universities : Issues in Higher Education - Part II"

"Current Affairs : Economics and Commerce - Part X

9.8.95

"Electrical Power"

"Alampur through the Ages - Part III"

"Muscle Formation and Cell Division"

10.8.95

"New Horizons - Part XXVI"

"Searching the Frontiers - Part I : Electro Ceramics"

11.8.95

"Starfinders : Discovery with the Hubble Space Telescope - II : Picture from Numbers"

"Drunken Driving"

"Management of Degraded Ecosystem - II"

12.8.95

"The Dawn After - Part I"

"Polo : The Royal Sport - Part I"

"Ground Water Recharge - Part II"

13.8.95

No Telecast

14.8.95

"The Week Ahead"

"Inflation : What is it all about"

"Agroforestry : A New Art in Agriculture"

15.8.95

"Special Programme on Completion of 11 years of Countrywide Classroom"

"Copper : Occurrence and Mining "

"Issues in Higher Education - Part II"

16.8.95

"Natural Products : Products and Science"

"Archaic Scripts of the World"

"Tulsi : From Worship to Cure"

17.8.95

"Searching the Frontiers - Part II : Bioceramics"

"Pigments and Dyes"

"Perspectives in Persian and Urdu on Indian Religions"

18.8.95

"Starfinder : Discoveries with the Hubble Space Telescope - Part III : Why a Space Telescope?"

"The Working Children of Kashmir"

"Mangroves - Life on the Margin"

19.8.95

"The Dawn After - Part II"

"Polo - The Royal Sport - Part II : The Modern Techniques"

"Looking at Paintings"

20.8.95

No Telecast

21.8.95

"The Week Ahead"

"Question Time - XVII"

"Kinetic Objects"

22.8.95

"Issues in Higher Education - Part IV"

"Ayurveda : The Science of Life - An Introduction"

"S.O.S. Waste"

Hindi Telecast

प्रातः 6.00 से 6.30 बजे तक

9.8.95

"राग संगीत – भाग 2 : यमन कल्याण"

11.8.95

"दो तीन नियम – भाग 1"

"मस्तिष्क मृत्यु"

14.8.95

"इतिहास के झरोखे से : दीवान मोहणोत नैणसी"

16.8.95

"राग संगीत – भाग 3"

18.8.95

"मिर्च"

21.8.95

"दो तीन नियम – भाग 2"

"द चिप"

News from Abroad

Air Pollution Stunts Crop Growth

Air pollution in the fast-growing cities of the third world may be stunting their food crops by 40 per cent, researchers at Imperial College, London have found.

This poses serious problems because the culprit pollutant, ozone, is increasing in concentration as car congestion and heavy industry increase, says Nigel Bell, of the college's Centre for Environmental Technology.

He and colleagues have produced the first substantial evidence that ozone is such a danger in the third world, although it is known to affect agricultural production in North America and Europe.

Ozone is produced in a photochemical reaction when sunlight shines on nitrogen oxides and volatile organic compounds. It is most common in conditions of still air, high temperatures and sunshine. It is produced in cities but it can waft over large areas and often exerts its worst effects in rural areas.

The work was done in conjunction with local universities in Egypt, on radish and turnip crops, and in Pakistan, on wheat and rice. In Egypt, some plants were coated with a chemical that prevents ozone getting into them—uncoated crops ended up 30 per cent smaller than coated ones. In Pakistan the crops were grown in open containers, half with charcoal-filtered air blown upwards at them. "We got a large reduction of 30-40 per cent in yield of wheat and rice in the ambient air compared to the charcoal-filtered air," said Professor Bell.

"We were surprised," he said. "It was so large an effect. It's possible that these crops from hotter countries may be more sensitive than others. We think it is a widespread effect.

"We've felt for a long time that the biggest impact of air pollution was going to be in the third world," said Professor Bell. "The third world is where most cities of more than eight million inhabitants are."

Skin Absorbs Chemicals

Scientists at St Mary's Hospital Medical School in London have developed a model that uses a sample of fresh human skin at 32°C supplied with fluids to keep it viable. They have found wide variation in the extent to which chemicals are absorbed — but some of the chemical always gets through.

Sheila Hotchkiss and colleagues have now tested about 30 substances. "It's just a question of how much and how quickly," said Dr Hotchkiss, lecturer in biochemical toxicology. "What I'm worried about is occupational exposure or exposure to chemicals in the garden".

Dr Hotchkiss found that most absorption happens within the first half hour. A layer of skin, the stratum corneum, which is half the thickness of paper, absorbs the chemical quickly and stores it like a reservoir, gradually releasing it into the body below. So washing chemicals off immediately is essential. Two aromatic amines used frequently in factories, MDA and MbOCA, were absorbed to the same extent whether left on for 30 minutes or 24 hours.

Dr Hotchkiss has found that for some chemicals, the skin is "far more important as a route" than is breathing it in.

The scientists found that cinnamaldehyde, which imparts a cinnamon smell to products such as soap, is 29 per cent absorbed. Phenol, a disinfectant mainly used in industry, which may be toxic, is 19 per cent absorbed. Even chemicals designed to be washed off immediately, such as shampoo, can be absorbed in the short time they touch the skin.

Dr Hotchkiss said gloves should always be worn when using household chemicals. Aromatherapy oils, which can be highly concentrated, should be properly diluted and washed off immediately if used in a massage. Covering up after coming into contact with a chemical can make matters worse because it prevents evaporation.

Genetic Clue to Multiple Sclerosis

Southampton University medical researchers have made a discovery in their search for genetic clues to multiple sclerosis (MS). The disease affects around two million people worldwide. It is twice as common in women as men, and the usual age of onset is mid to late 20s.

Its cause is unknown, and as yet there is no effective cure. In about a fifth of cases, a second member of the family is also affected. This suggests that genetic susceptibility plays a part and various research groups are investigating different genes in a bid to discover which might be contributing to this.

MS destroys myelin, a nerve film in the central nervous system which allows electrical impulses to be conducted rapidly round the brain and spinal cord. The destruction of this myelin insulation leads to delayed conduction and disability.

The Southampton research team has been examining the genes responsible for producing the myelin membrane. "We have already made the exciting discovery that myelin contains 'rho' proteins," said Rod Thompson of the clinical biochemistry group.

"These act as molecular switches, transmitting signals involved in the formation and movement of membranes in various types of cells, and are likely to be key molecules in the myelin membrane."

Master of Publishing Programme

Simon Fraser University, Vancouver, Canada has announced the implementation of its Master of Publishing programme. The programme opens on September 1, 1995, and consists of six courses covering history of publishing; contemporary publishing forms; technological development and the future of publishing; finance, economic, law and policy; editing; design and production. Full-time students will enrol in three courses from September to December, and a second three courses from January to April.

Further information may he had from the Director of the programme: Mr. Rowland Lorimer, Master of Publishing Program, Simon Fraser University, Burnaby, B.C. V5A 1S6, Canada.

We Congratulate ......

1. Mr. K.C. Pandya who has been appointed Vice-Chancellor of the University of Gorakhpur, Gorakhpur.

2. Dr. Murlidhar Tiwary who has been appointed Vice-Chancellor of the Rohilkhand University, Bareilly.

3. Prof G.K. Das who has been appointed Vice-Chancellor of Utkal University, Bhubaneswar.

BOOK REVIEW

A Signal Contribution

G. Mishra*

M.V. Pylee. India's Constitution. Fifth and enlarged edition. New Delhi, S. Chand, 1994. Pp. x+390. Rs. 100/-.

India's Constitution, the basic legal text of the country, has been the theme of several books. Some of these books have been authored keeping in view a particular class of readers such as jurists, lawyers, and lawmen. The book, under review, does not suffer from such limitation. On the contrary, it is for all those who desire to educate themselves in this area. Divided into seven parts and forty two chapters, the book comprehends all aspects of the constitution such as the basic principles underlying the constitution, its historical background, the preamble, territory and citizenship, fundamental rights and directive principles, the union executive and the legislature, the state executive and the legislature, the union and the state judiciary, distribution of legislative, administrative and financial relations between the union and the state, inter state trade and commerce, provisions relating to emergency and miscellaneous provisions. Article based analysis of the above topics of the constitution makes its reading not only exhaustive but authentic also. References to the Constituent Assembly Debates and important judicial decisions further make the reading easy to appreciate the provisions of the constitution in their right perspective. The information contained in the tabular statements regarding Part A,B,C and D states and their position after the recommendations of the States Reorganisation Commission, number of members (in Lok Sabha and Rajya Sabha) from each state and union territory, relative strength of All India political parties in Lok Sabha from 1952 to 1991, high courts with year of their establishment, territorial jurisdiction and number of judges, number of reserved seats for schedule castes and schedule tribes in Lok Sabha and state legislative assemblies and the like, significantly enrich the reading of the book. The chapter on elections (chapter 39), apart from the general provisions relating to elections, discusses the position of political parties in the last ten general elections conducted in the country which adds a new dimension of knowledge. The chapter on 'Administrative Tribunal' is yet another example of the kind. Further, the book contains several criticisms made against various provisions of the constitution and meets them satisfactorily. One may differ on such answers but the underlying purpose of inculcating a critical outlook of the readers cannot be undermined.

The book, however, contains a few omissions as well. Although pointing out such omissions hardly form a comment on what it contains yet they do reflect on the limitation and scope of the topics discussed therein. While dealing with "Equality of opportunity in matters of public employment (Art. 16)" the omission of the Supreme court decision in Indra Sawhney v. Union of India, (AIR 1993 SC 477) commonly known as Mandal Commission Case, is conspicuous.

It may be mentioned here that the above case not only finally settles the reservation matter in the country but clarifies several other matters associated with reservation also. The issues raised and answered by the apex court in the above case have far reaching impact on the Indian social fabric. Again, in chapter 12, "Cultural and Educational Rights (Arts. 29 and 30)", the omission, of St. Stephen's College v. The University of Delhi, (AIR 1992 SC 1630) has led to an erroneous conclusion (being no. 5 on page 113). Similarly, the omission of Art. 300A in the discussion of "Right to Property" deprives one to know its constitutional position today.

Written in easy style with brevity but without sacrificing the essentials, the book is a work of deep scholarship and vast learning. The author has extensively researched the various topics of the constitution and put them in right perspective. It is a signal contribution. The fact that the book is in its fifth edition exemplifies its popularity and usefulness.

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* *Reader, Campus Law Centre, University of Delhi, Delhi - 110 007.*

THESES OF THE MONTH

A list of doctoral theses accepted by Indian Universities

HUMANITIES

Philosophy

1. Shiraishi, Ryokai. **Asceticism-early Buddhism and Dharmasutras: A comparative study.** Delhi.

Religion

1. Naik, Chandrashekhar Dejibaji. **Inequality of religions and need of conversion with special reference to Buddhism and Dr Ambedkar.** Nagpur. Dr B B Lakhande, Head, Department of Pali and Prakrit, Nagpur University, Nagpur.

2. Rahman, Md Mahboobur. **Muslim religio reform movements in Bengal during the nineteenth century.** AMU. Prof Abdul Aleem Khan.

Fine Arts

Music

1. Arora, Prema. **Impact of music: A scientific study.** Delhi.

2. Dhamankar, Vijaya. **Goswami Tulsidas ke geetikavya mein nihit sangit tatva.** Devi Ahilya. Dr Suman Dandekar, 30, Jati Colony, Indore.

3. Nagpal, Alka. **Senia gharane ke Ustad Mushtaq Ali Khan ka sangeet ko yogdan: Ek adhyayan.** Delhi.

4. Saini, Rita. **Hindustani sangeet aur adhyatmik chintan parampara.** Delhi.

5. Sharma, Sunita. **Bhartiya sangeet mein nihit darshanik tatha adhyatmik tatvon ka avalokan.** Delhi.

6. Shrikhande, Sulbha. **Bharatiya sangit mein Meera ka yogdan.** SNDT. Dr G H Tarlekar, Head, Sans Souct, 7, Saraswati Housing Society, Shivajinagar, Pune.

7. Subrahmanyam, Sulochana. **Temple and deities as depicted in the compositions of Muthuswami Dikshitar.** Delhi.

8. Syamalamba, L. **A study of the special status enjoyed by Telugu as the medium for musical compositions.** Delhi.

9. Verma, Gita. **Sangeet mein shodh kee prakriya evam strot.** Delhi.

Language & Literature

English

1. Afeeta Banu. **The absurd drama: A stylistic study with reference to the plays of Samuel Beckett.** CIEFL. Prof V Prakasam.

2. Agarwal, Rajesh Kumar. **Naturalism in the novels of Frank Norris.** H S Gour. Dr H S S Bais, Department of English, Dr Hari Singh Gour Vishwavidyalaya, Sagar.

3. Bhargava, Ritu. **A comparative study of the trilogies of Aeschylus, Shakespeare and O'Neill.** Devi Ahilya. Dr S Samtani, 38, Padmavati Colony, Behind Saint Paul School, Indore.

4. Bhelande, Anjali. **An analysis of Ethel Wilson's works from the point of view of Indian philosophical thought.** SNDT. Dr S Kudchedkar, Empress Court, Churchgate Reclamation, Near Oval Maidan, Bombay.

5. Goyal Sharma, Veena. **The themes of nationalism and ethnicity culture and identity in East and West African literature, in English.** JNU. Prof Anirudha Gupta, Centre for West Asian and African Studies, Jawaharlal Nehru University, New Delhi.

6. Kadambi, Rama. **Esoteric thought in the poetry and plays of W B Yeats.** Bangalore. Dr S Ramaswamy, 58, 203, West Park Road, Malleswaram, Bangalore.

7. Kubendran, M R. **Gandhism in Indo-Anglian novels, 1986-1991.** Gandhigram. Dr B Regina Papa, Department of Women's Studies, Alagappa University, Karaikudi.

8. Nandy, Gouri. **William Somerset Maugam: His mind and art.** Nagpur. Dr B V Mohril, Department of English, Dharampeth College, Nagpur.

9. Pande, Padmakar Vishweshwar. **Pinter's personal poetics: A critical study of plays of Harold Pinter.** Nagpur.

10. Puranik, Pramod Dinkarrao. **A stylistic study of English advertisments appearing on hoardings in Nagpur City.** Nagpur. Dr R P Saxena, Department of Linguistics, Nagpur University, Nagpur.

11. Titus, T K. **Social criticism in T S Eliot's works and its relevance in our times.** Nagpur. Dr S C Verma, Department of English, Nagpur University, Nagpur.

12. Yadava Raju, B. **The novels of V S Naipaul: A study in nihilism.** Osmania. Dr K Srinivasa Sastry, Department of English, Osmania University, Hyderabad.

French

1. Patel, Poulasti Kumar. **L'Esthetique d'Andre Malraux.** JNU. Dr Rita D Sil, Centre for French Studies, Jawaharlal Nehru University, New Delhi.

Sanskrit

1. Anare, Ratan Singh. **Sanskrit natya sahitya mein Bharat Varsh ka prakritik bhoogol, 15 vin shati tak ke pramukh roopkon ke vishesh sandarbh mein.** Devi Ahilya. Dr Pushpa Jha, Department of Sanskrit, Govt Mahakaushal Arts and Commerce College, Jabalpur.

2. Das, Kanhu Charan. **Goponathpattnayakkritya Shudranhikapdhatya sameekshnatmak sampadanamn.** Jagannath. *Dr Jayakrushna Mishra, Lecturer, Department of* Dharmashastra, Shri Jagannath Sanskrit Vishvavidyalaya, Puri.

3. Harish. **Dhatvartha-Nirnaya evam Dhatvartha-Nirupana ka tulanatmaka adhyayana.** Delhi.

4. Jatinder Kumar. **Atharvaveda ke sayanabhasya kee sameeksha.** Delhi.

5. Khanna, Saroj. **Kalidasa ke jeewan mulya: Adhunik sandarbh mein.** Delhi.

6. Meenakshi, V. **The influence of Valmiki on Kalidasa.** Delhi.

7. Mishra, Rajalaxmi. **Gadadharrajgurukrit Acharsarasya sameekshnatmak sampadanam.** Jagannath. Dr Jaya Krushna Mishra, Lecturer, Department of Dharmashastra, Shri Jagannath Sanskrit Vishwavidyalaya, Puri.

8. Sarma, Kolluru Avatara. **Allied figures: A critical study.** Andhra.

9. Sharma, Dipak Kumar. **Sesakrsna's Parijataharana Campu: A study.** Gauhati. Dr A K Goswami.

10. Sushma. **Kavyaprakash kee Candidasakrita Dipika Tika evam Visvanathakrta Darpana Tika ka tulnatmaka adhyayana.** Delhi.

11. Sushma. **Vaidika sahitya mein sam tattva.** Delhi.

12. Tyagi, Archna. **Natyashastriya vastu vivechana: Prachina evam adhunika pariprekshya mein.** Delhi.

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Reference Advt. No. H-139/95-96 appeared at page 39 of *University News* issue dated June 26, 1995.

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FIELDS OF INTEREST:

1. MICROWAVES AND ANTENNAS: Specialisation in Numerical Electromagnetics, Antennas, Microwave integrated Circuits/Components or Microwave Communication
2. MICROELECTRONICS: Specialisation in Solid State Device Design and Technology
3. COMMUNICATION SYSTEMS: Specialisation in Wireless or Optical Communication with emphasis on Layer 1 issues.

Details and application form can be obtained on a request accompanied by an IPO for Rs 10/- drawn in favour of the Registrar (free of cost to SC/ST candidates on production of caste certificates) along with self addressed stamped (Rs 2/-) envelope of the size 28 x 18 cms. **on or before 16th August, 1995.**

Completed applications alongwith copies of certificates, publications and a research plan for the next few years should reach the Registrar **on or before 31st August, 1995.** Referees may be requested to send their considered reports to the Registrar.

R(IA) 308-13/95 **REGISTRAR**
Date: 17.07.1995

HOMI BHABHA CENTRE FOR SCIENCE EDUCATION

Tata Institute of Fundamental Research
V.N. Purav Marg, Bombay - 400 088

ADVERTISEMENT NO. 3/95

The Homi Bhabha Centre for Science Education (HBCSE), a constituent unit of TIFR, is engaged in research and development in science and mathematics education, writing of books and materials, teachers training and talent nurture programmes for students at various levels. It is also involved in development of low cost integrated laboratory for schools and advanced laboratory at post-school levels. HBCSE carries out considerable field work in Maharashtra and also has a strong collaborative programme with the Atomic Energy Education Society which runs schools in different parts of the country.

The activities demand a combination of academic excellence, sustained interest in science communication and a strong inclination for teaching and/or laboratory development. HBCSE's new campus at Anushaktinagar has good infrastructure facilities and the Centre is poised for expansion. It is keenly looking for young and motivated scientists who will participate and play a leading role in its activities. The openings are described below :

1. **RESEARCH SCHOLARS :**

   Qualification : Consistent first class career including a Master's degree in natural sciences/mathematics/statistics. Selected candidates will have an opportunity to submit their work for a Ph.D. in science education in the faculty of science to the University of Bombay. A research scholarship carries a consolidated honorarium of Rs. 2700/- per month, which may be raised to Rs. 3000/- per month after two years depending on the scholar's progress and performance. Candidates not accommodated in the hostel will be eligible for a house rent allowance of Rs. 450/- per month. Research Scholars are also entitled to a book grant of Rs. 3000/- per year up to a period of five years. The scholarships are offered for a period of one year in the first instance and are renewable from year to year. *After completion of Ph.D. outstanding scholars may be considered for absorption in the* academic staff of HBCSE.

   Age : Below 25 years.

2. **POST DOCTORAL FELLOWS :**

   Qualification : Good academic record with a *Ph.D. in natural sciences/mathematics/statistics/* sociology/psychology/education. The primary selection criterion will be a broad-based competence in the area of specialization combined with a flair for writing/teaching/laboratory development. Selected candidates will be offered a consolidated fellowship of Rs. 4,000/- per month (or higher in case of candidates with exceptionally good credentials) for a period of one or two years. They will also be paid house rent subsidy of Rs. 1000/- per month in lieu of institute accommodation. At the end of the fellowship, outstanding candidates may be considered for absorption in HBCSE.

   Age : Below 35 years.

   Age will be relaxable in case of deserving candidates.

Interested candidates should write to the Administrative Officer, Homi Bhabha Centre for Science Education (HBCSE), V.N. Purav Marg, Mankhurd, Bombay-400 088 requesting for an application form for Research Scholar/Post Doctoral Fellow. Completed application forms should reach HBCSE on or before **31st August 1995.**

UNIVERSITY NEWS, MONDAY, JULY 31, 1995 Regd. No. R.N. 7180/63 Postal Regd. No. DL–11106/

SHASTRI INDO-CANADIAN INSTITUTE

FELLOWSHIPS FOR THE ACADEMIC YEAR 1996-97

The Shastri Indo-Canadian Institute, with funding from the Canadian International Development Agency, invites applications from established Indian scholars for fellowships in the following category:

1. **WOMEN AND DEVELOPMENT FELLOWSHIPS**
2. **SOCIAL SCIENCES AND HUMANITIES FELLOWSHIPS**

Since these fellowships are a part of the Institute's Development Studies Programme, to be work carried out during the tenure of fellowships must have a clear developmental significance.

Eligibility : Candidates must be

- i) citizens or permanent residents of India,
- ii) be established scholars with demonstrated research abilities,
- iii) have a clear and focused plan of work which can reasonably be *implemented during the tenure of the fellowship, and*
- iv) be prepared to leave for Canada no later than 1 January 1997, if selected.

Duration : Four months between 1 September 1996 and 30 April 1997.

Value :

- i) excursion-rate return airfare between India and Canada,
- ii) $ 500 for books and personal effects,
- iii) $ 1,500 per month for a maximum of four months of actual stay in Canada for meals and incidental expenses, and
- iv) up to $ 1,000 per month for a maximum of four months of actual stay in Canada for rented accommodation.

LAST DATE FOR RECEIPT OF COMPLETED APPLICATIONS IS SEPTEMBER 30, 1995.

Please write for the application form (specifying the category of fellowship) by sending a self-addressed Rs. 4/- stamped envelope (5"x10") to:

Resident Director
Shastri Indo-Canadian Institute
5, Bhai Vir Singh Marg
New Delhi-110 001.

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